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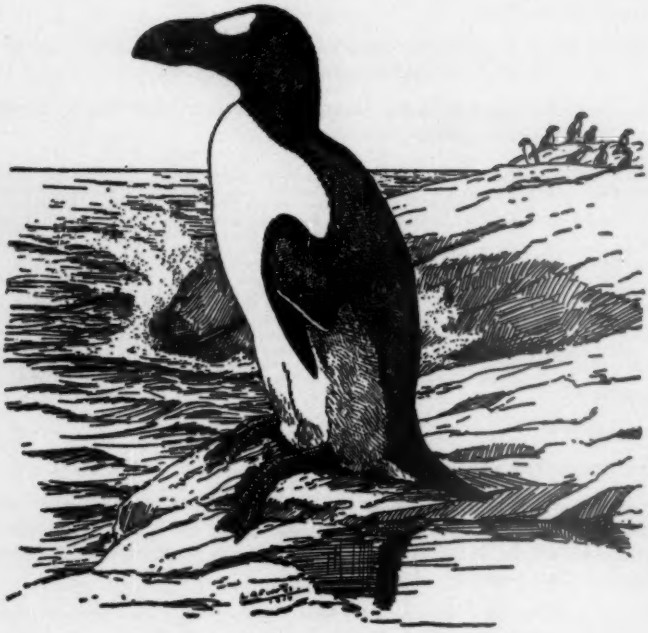

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(*Upper*) Sprague's Pipit, *Anthus spragueii;* juvenile female; about 13 days old; out of nest two or three days; St. Charles, Manitoba; August 22, 1931; R. O. M. Z. No. 29,399. See also page 379.

(*Lower*) American Pipit, *Anthus s. spinoletta;* juvenile male; about 11 or 12 days old; out of nest and capable of flight; Cape Dorset, Baffin Island; July 25, 1938; R. O. M. Z. No. 31,482.

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ON THE JUVENAL PLUMAGE OF NORTH AMERICAN PIPITS.—While there are excellent descriptions of the juvenal plumages of the two species of North American pipits, Sprague's Pipit, *Anthus spragueii* (see Harris, Can. Field-Nat., 47: 94) and Water Pipit, *Anthus spinoletta* (see Dwight, Ann. New York Acad. Sci., 13: 289) I have been unable to locate colored illustrations of either. The frontispiece of this number of 'The Auk' is thought, therefore, to present these plumages for the first time.

The juvenile of *A. spragueii* was drawn from a specimen taken at St. Charles, near Winnipeg, Manitoba, on August 22, 1931, and represents a female, 13 days after hatching. The drawing of *A. spinoletta* is that of a young male, possibly 12 days old, collected at Cape Dorset, Baffin Island, on July 25, 1938. Notes on the colors of soft parts were made of each at the time of collection. The specimens are, respectively, numbers 29399 and 31482 in the Royal Ontario Museum of Zoology, Toronto.

It will be seen that these two species are more markedly distinct in juvenal than in adult plumage. The juvenal plumage of *spinoletta* is essentially similar to the adult plumage, except that the streaking is coarser and more extensive, both above and below. The juvenal plumage of *spragueii* is more distinctive. The feathers of the scapular and interscapular tracts are margined completely with pale buff and whitish and present a "scaled" effect, reminiscent of the back pattern of some juvenile sandpipers, particularly Baird's Sandpiper, *Erolia bairdii*.

Reference to Witherby *et al.* (The Handbook of British Birds, Vol. I) and to specimens in the R. O. M. Z. bird collection reveals that several Old World species of *Anthus* resemble *spinoletta* in possessing a streaked back-pattern in the juvenile plumage. These are *A. trivialis*, *A. pratensis*, *A. cervinus*, *A. gustavi*, etc. Another group, including *A. campestris* and *A. richardi*, appears to resemble *spragueii* in having a "scaled" dorsal plumage. Perhaps of some significance to the systematist is the even greater resemblance between the juveniles of *A. spragueii* (Motacillidae) and *Lullula arborea*, the Wood-lark (Alaudidae).

A circumstance that struck me forcibly while collecting specimens of juvenile birds in the prairie region of Manitoba was the similarity in juvenal plumage of three species of birds, representing two families, that were closely associated on the nesting grounds. I refer to Sprague's Pipit, Baird's Sparrow, *Ammodramus bairdii*, and Chestnut-collared Longspur, *Calcarius ornatus*, all of which have a "scaled" pattern on the dorsal area. This was considered somewhat remarkable, especially since the "scaled" juvenal plumage is not common among the Fringillidae and since another species of *Calcarius* (*C. lapponicus*) has the dorsal surface streaked.

The implication seemed to be that there may be some survival value in a "scaled" dorsal plumage for prairie-nesting passerine birds, though why it should be more advantageous than a streaked plumage is not obvious.—T. M. SHORTT, Royal Ontario Museum of Zoology, 100 Queen's Park, Toronto, Ontario.

NEW LIGHT ON THE CAHOW, *PTERODROMA CAHOW*

BY ROBERT CUSHMAN MURPHY AND LOUIS S. MOWBRAY

Earlier History

The Bermuda Petrel, *Pterodroma cahow*, has been presented to the world as a mixture of legend and fact. Information from the early 17th century was voluminously quoted and oddly misinterpreted by A. E. Verrill (1902), whose several publications followed a gap of nearly 300 years during which there had appeared no unequivocal or original references to the living bird. Most 19th century writers had confused the species with Audubon's Shearwater, *Puffinus lherminieri*, or with the Manx Shearwater, *Puffinus puffinus*, both of which breed, or have bred, at Bermuda. The uncertainty is exemplified by the remarks of Newton (1896), Tristram (1902), and the more recent compilation by Bent (1922).

Verrill's account, reduced to brief summary, is that the first Bermudian settlers of 1609 encountered a fabulously abundant sea-fowl that came to the archipelago to nest in the winter season but was absent in summer. It was nocturnal and burrowing in its habits, extremely noisy, fearless of man, and had edible flesh and eggs. Its center of population in that period was at Cooper's Island, southwest of the eastern end of Bermuda. As human food, the Cahow saved some of the colonists from starvation, particularly in the famine of 1614–1615, but by reckless exploitation the bird itself was extirpated by 1621 or thereabouts.

Verrill, writing in the absence of specimens, inferred that this historic sea bird was a member of the auk family (Alcidae). It could not have been a petrel, he reasoned, because the bird and its egg were palatable. The argument has no force with anyone who has enjoyed meals of several kinds of squid-eating "mutton birds" and has found eggs of the Sooty Shearwater, *Puffinus griseus*, equal in taste to hens' eggs. Tristram (1902: 447), aware of this, had promptly responded: "The ten reasons assigned by Mr. Verrill for the cahowe not being a shearwater are most of them proofs that it is." If Tristram had written merely "petrel," instead of "shearwater," he would have been absolutely correct.

When relics of birds from Bermudian caves began to be studied (Shufeldt, 1916 and 1922), it became evident that at least three members of the Procellariiformes, including a form of the genus now called *Pterodroma*, had in glacial or early postglacial time occupied

Bermuda far more extensively than at the date of human colonization. In parts of this prehistoric period the land area was greater than now, owing to a lowering of ocean level during the Ice Age. The climate was also cooler, and the nature of the fossil birds' eggs suggests a more diversified avifauna than that of the present. Wood (1923) has reported upon ancient eggs of petrels and tropic-birds, but still unstudied specimens in the Government Museum at Flatts indicate that waterfowl of the size of swans were likewise present.

Shufeldt described and liberally figured the osteological remains. His statement that Bermuda caves are not more than five centuries old (1916: 624) is, of course, erroneous. Today many of the caves contain large stalagmites submerged under salt water at the current mean level of the ocean. These could have been built up only in the Pleistocene or during some marked postglacial lowering of sea level. Wood may be more nearly correct when he ascribes to some of the fossil eggs an age of the order of 100,000 years. It is equally likely that Cahows and other petrels that have left their bones in the limestone of caverns, fissures, and indurated dunes date in part from a similar period.

Early in the present century, the colonists' term "cahow," derived from the voice of the bird, had become definitely associated with a particular kind of petrel skeleton. But not until 1916 was a technical name, accompanied by a description of morphology and plumage, applied to the species. The type specimen, a mounted bird of undetermined sex, now in the American Museum of Natural History, was, so far as is recorded, the only example of the Cahow that had been seen alive in almost three centuries. It was captured on Gurnet Rock off Castle Roads by Louis L. Mowbray on February 22, 1906, and was first referred to in print as "*Aestrelata gularis*," the name of a New Zealand petrel (Bradlee, 1906). A decade later, it was described as *Aestrelata cahow* by Nichols and Mowbray (1916), and later in the same year Shufeldt described the species from skeletons as *Aestrelata vociferans*.

For a score of years thereafter nothing more was learned, but it seems to have been increasingly assumed that the Cahow is a close relative, or even a subspecies of, *Pterodroma hasitata* or "*caribbaea*," the West Indian petrel (Shufeldt, 1916, and Bond, 1950; 174, footnote).

References to all publications relating to the Cahow, up to the year 1930, are included among the bibliographies of Verrill, Bent, and Bradlee, Mowbray, and Eaton (1931). For this reason no attempt is made to list them anew in the present paper.

On June 6, 1935, a fledgling female petrel of the same species as the type specimen struck St. David's Light, close to Cooper's Island, and came into possession of William Beebe (1935) who reported upon it. This example is likewise preserved in the American Museum. It differs from the type only in familiar criteria of youthfulness, which include slightly smaller feet and bill and a tuft of down on the lower belly. Its stomach contained 17 beaks of cephalopods and several crystalline lenses of the same organisms.

Dr. Beebe's spirited account of the rediscovery is exceedingly interesting. He left no doubt that the bird he had examined in the flesh was identical with that represented in the same vicinity by fossil and subfossil bones. He was the first to resurrect the pre-settlement account of the Spanish explorer, Diego Ramírez, which strongly suggests that, before the advent of men or pigs at Bermuda, the Cahows bred thickly over the greater part of the main islands. Ramírez and his crew devoured thousands and "brought away more than 1000 well dried and salted for the voyage" (Beebe, 1935: 187).

During World War II, an American naturalist and Army officer, Fred T. Hall, now director of the Buffalo Museum of Science, was stationed at Bermuda close to the Castle Roads area. Encouraged by the junior author, he made a hunt for the Cahow, finding old bones, fragments of birds apparently killed by rats, and, on March 14, 1945, he came into possession of a partly disintegrated adult that had floated ashore. It was particularly the experiences of Mr. Hall that led the writers of the present report to renew the search in 1951. Funds for field work were provided through gifts to the American Museum of Natural History by Mr. Childs Frick, and by the Pan-American Section of the International Committee for the Preservation of Bird Life, of which Mr. Marshall McLean is treasurer.

Much cooperation in Bermuda was also enjoyed by the authors during their field work. Dr. Louis W. Hutchins, Director of the Bermuda Biological Station for Research, put all the facilities of the laboratory at our disposal. Mr. Bernard Wilkinson gave us *carte blanche* in Crystal Cave, Mr. A. Elystan Haycock in Wonderland Cave, and Mr. Idwald Hughes in an unexploited cave at the Government Quarry. Colonel T. H. Watkins, Executive Officer at the United States Air Base, supplied transportation for a reconnaissance on Cooper's Island. Messrs. James Williams and S. L. Perinchief, of the Bermuda News Bureau, accompanied us to some of the islands and have been lavish in making and supplying photographs. To all of these, and to many other citizens or residents of Bermuda we are deeply grateful.

(*Top* and *Middle*) INCUBATING CAHOW, EXTRACTED FROM THE FIRST NEST DISCOVERED, JANUARY 28, 1951. (*Bottom*) WESTERLY FACE OF GURNET ROCK, THE TYPE LOCALITY OF THE CAHOW. (ALL THREE PHOTOGRAPHS BY R. C. MURPHY.)

It should be recorded here that for more than a quarter-century the junior author has remained convinced of the persistence of the Cahow as a breeding Bermudian bird. Visits to the islets with his father, beginning in January, 1924, when courting Audubon's Shearwaters were discovered, were followed at frequent intervals by observations that indicated the presence of an additional local petrel. These led in turn to recommendations to the Bermuda Legislature concerning the protection of probable breeding grounds, and finally, in 1951, to the discovery of the nesting population.

PRESENT STATUS

The condition of the islands off Castle Roads has undergone recent change due to engineering and military activities. Cooper's Island has been linked up with the larger St. David's Island through dredging and filling, and it now forms part of the Bermuda Air Base. We were given the privilege of making a reconnaissance of the old Cooper's Island breeding ground. Superficial digging with pick and shovel was undertaken in likely spots, but no trace of Cahows was discovered. It is probable, however, as suggested by Verrill, that pockets of ancient bones may yet be unearthed in a vicinity once so densely populated.

Islets offshore, like Cooper's Island itself, have evidently fallen within the war-time target area, for the tops of some of them are peppered with green, corroded, and distorted bullets of small arms. So far as could be judged, this has had no deterrent effect upon the return of the Cahows. Even more remarkable is the fact that the petrels still come back seasonally to their ancestral homes despite the blinding glare of beacons on the nearby air field and the roar of planes that pass overhead day and night from one year's end to another.

For our investigations among the islets we made use of a seaworthy diesel launch belonging to the Government Aquarium of which the junior author is curator. This craft could be anchored offshore or sent back to its base, according to weather conditions, leaving us a towed skiff for our landings. It proved feasible to moor the skiff well out from the surge around the rocks during inspections lasting from an hour or less to as long as 16 hours (overnight). For a voyage to western Bermuda, including an examination of Daniel's Islet, off Somerset, we used a fast gasoline launch generously offered and operated by its owner, Mr. Warren Lutz.

The period of field work extended from January 25 to February 10. Practically all islets off Castle Roads were visited, except Gurnet Rock, the type locality of the Cahow. Landing is possible on this stack only after prolonged calm. During weather too inclement for

work at sea, we investigated a number of Bermudian caves and quarries, obtaining a quantity of ancient Cahow bones but no integrated skeletons. In former years, one or more caverns in the steep western coast of Castle Harbor were famous for rows of calcified petrel skeletons ranged along natural shelves of the walls. These became inaccessible when the caves were filled in the course of building operations.

With the object of furthering the safety of the surviving Cahow population, the localities known or suspected to be inhabited by the birds will not here be precisely identified. All but two lie in the Castle Roads group of islands. One is situated not far from the opposite or western extremity of Bermuda. A third area of probable occupation is in a high cut-bank near the north shore of one of the main Bermudian islands. Nocturnal observations for verifying presence of the birds at the two last-named sites have not yet been made.

Early in the course of our field work we learned that the likelihood of finding Cahows was in inverse ratio to the prevalence of rats. Castle Island, for example, is large, readily accessible, and frequently visited because of its well-preserved 17th century fortifications. Brown rats abound and can even be seen along the limestone walls at midday and in bright sunlight. Quite naturally, the island appears to have no burrowing or ground-nesting birds of any sort.

Remains of rats, mingled with bird bones, were found at three sites. They comprise jaws with teeth, limb bones, and various fragments, but, according to Mr. George G. Goodwin of the American Museum Department of Mammals, it cannot be certainly ascertained whether they represent the brown rat, *Rattus norvegicus*, or its earlier congener, one of the forms of *Rattus rattus*.

The oldest rodent remains, to judge from their calcareous incrustation, were found with bones of the Cahow under phosphatic earth in a chasm of the Crystal Cave remote from the routes followed by visitors. Similar bones of considerable age are from recently exposed caverns in the face of the Bermuda Government quarry on the west side of Castle Harbor.

On Outer Pear Islet, in Castle Roads, much more recent rat bones were found on the surface, or just under the surface, of soil on the plateau of the island. These were among bones of both the Cahow and Audubon's Shearwater, including a substantially complete skull of each of these two petrels. The point of special interest is that there was no trace of living birds here or in any other locality discovered to be occupied, or to have been occupied, by rats.

The first proof of Cahows in residence was found on January 28, 1951, at an islet which may be called "A." Like others of the group, it is greatly eroded, broken into several nearly distinct parts, and overgrown on the crown with grass, prickly pear, sea lavender, *Mesembryanthemum*, and a few other halophytic plants. We scrambled ashore in the forenoon, accompanied by a youthful Bermudian ornithologist, David B. Wingate, of Aldie, Smith's Parish. In several places at levels 20 to 30 feet above the water there were holes in interbedded reddish soil under or between the limestone strata. Fresh earth at the entrances revealed neither scratches nor footprints, but there were soft patches of green and whitish excreta such as are characteristic of squid-eating sea birds. It seemed discouraging at the time that we could detect no trace whatsoever of the familiar musky odor that is ordinarily a tell-tale of petrels within.

Most of the tunnels were not only deep but were also curved or bent. Presently we located one in which, by the aid of an electric flashlight, a bird could be seen in the nest chamber. The entrance was situated at the rear of a rocky niche large enough to accommodate a man's head and shoulders. Four feet within this niche a nearly level excavation, seven to eight inches in width and somewhat less in height, had been bored in a straight line to a horizontal depth of just over six feet. With a noose at the end of a pole we presently succeeded in hauling out the bird. It was the hoped-for but only half-anticipated Cahow. The egg that it had been covering could then be seen in the nest.

Our exciting captive bit the hands that grasped it, but only briefly and half-heartedly. Within a moment it became completely nonresistant, allowing itself to be stroked, tickled, and passed from hand to hand. We photographed it, jotted down hasty descriptions of its flesh colors, and other features, and placed it on the sandy floor of its cave, whereupon it entered the burrow and scurried back to its egg. During the whole period of badgering, extraction, and handling, it had neither uttered a sound nor ejected oil from the throat or nostrils. The last point is noteworthy. No Cahow handled during our visit spewed out stomach oil in the reaction that is so common among petrels. All the birds remained calm, dry, and fluffy, as well as practically devoid of odor.

Without the expected aid of vocal indications and the "petrel smell," it was difficult to make a census of neighboring burrows. We found, however, one other in which our flashlights revealed a sitting bird, and we concluded that the distinctive excreta, the appearance of the moist spoil of digging at the entrances, and a litter of green twigs in the passages were all indications of occupancy. Barricades of tooth-

pick size were set up by us in the loose soil of several burrows in order that the comings and goings of Cahows might be determined on a subsequent visit.

Observations during the next week indicated that islet "A" might be the current home of as many as nine pairs of Cahows, islet "B" of three or possibly four pairs, islet "C" of one pair. Eight other islands, including Castle and Nonsuch, yielded only negative indications. Gurnet Rock, as noted above, could not be closely inspected because of rough seas.

NOTES ON BEHAVIOR

The Cahow comes to its nest after dark and departs long before daylight. This is typical of petrels of its group and is, moreover, precisely described in accounts of the Bermuda species dating from the days of colonization.

The next step, therefore, was to take stations on islet "A" in late afternoon of January 29 and to stand watch through the night. The swell was high in Castle Roads and the ocean still rougher off Gurnet Rock and outside the boiling skerries, but we found quieter waters as soon as we had passed through a gap in the reef just east of the tip of Cooper's Island. Mrs. Murphy and Mr. Wingate were landed with us on a convenient ledge and, because of boisterous weather, the launch was sent back by way of St. David's Head and the north shore to the Aquarium at Flatts. With the aid of a seven-foot ladder we transported our gear over a miniature precipice to the top of the islet and made everything shipshape before daylight wholly faded.

For the early evening, all hands stationed themselves beside the gully leading to the first Cahow's nest we had discovered. Later we spread out into several parts of the islet so as to keep as many nests as possible under observation.

After dark, revolving signals of Kindley Field periodically touched the summit of our island with faint gleams, and even the fixed lights were strong enough to make our own shadows perceptible on rocky walls. Moreover, the drone and thunder of planes rarely ceased. Yet as soon as the sky had lost all trace of afterglow, we began to see swift silhouettes of birds overhead, and from time to time to hear single, soft, *screepy* notes. At 8:32 p. m. a Cahow fluttered above our huddled forms on the ledge, passing several times back and forth in front of the niche. Then it dropped silently into the entrance. Three torches were turned upon it, and the bird was picked up. It made no struggle and did not offer to bite. We all examined it, then

put it on the earth in the niche, from where it walked unhurriedly into the burrow, carrying its wings slightly spread and drooped.

The night became overcast, and showers fell at intervals. Shortly after nine o'clock a group of Cahows flitted about, each bird glimpsed in a twinkling against the dark sky. Our watchers had by this time dispersed to their several stations. Each member saw birds, and David Wingate, the youngest, heard the single soft note more often than the rest of us. It was not easy to estimate the number of Cahows in flight, because they all scouted to and fro briefly before coming down to their subterranean retreats. Thirty individuals might be a reasonable guess.

At this stage of our operations the homing problem impressed us with particular force. The Bermudas are surrounded for a long distance by a relatively featureless ocean, by which is meant that the surface water on one side could hardly be distinguished by physical characters from that on any other side. This would be true for distances of scores or even of hundreds of miles. Furthermore, the breeze blows all around the compass in any week, or sometimes on any day. There would be nothing like a steady trade wind or westerly to serve as a guide for the petrels. Yet the Cahows set forth in darkness, fly no doubt for many hours out of sight of a land area totalling only one-fourth that of Staten Island, New York, and of considerably less altitude and visibility, and then, after the customary interval, head back in darkness to relieve their mates on the egg. As a feat of navigation, this is more remarkable than the much longer migratory flights by certain birds along routes possessing landmarks or their equivalent.

Mrs. Murphy and the senior author remained at the first nest except when one of them left briefly to exchange reports with Mowbray and Wingate. At frequent intervals they crawled to the burrow, turned torches down the tunnel, and watched the pair of Cahows. The birds made no audible sound, but they expressed mutual satisfaction or affection in many other ways. The beam of light apparently created no disturbance. They could be seen nibbling each other's beaks and necks and then launching into an "ecstatic" turn-around in the small chamber, puffing up their plumage and shuffling about each other on flat tarsi. At such times it was not always possible to discern whether one remained on the egg or whether the latter merely lay in the middle of the melée.

At 11:40 p. m., when the light was switched on the burrow, one bird was sitting at the threshold quietly, as if ready to depart. The other was far within, presumably on the egg. The mates had thus

remained together, carrying on their connubial display for approximately three hours. As we prepared to make a flashlight photograph, the Cahow at the door suddenly turned and retreated into the tunnel. But some time between then and midnight it slipped away silently into the blackness. From then until morning no further activity was observed.

Traditionally, the Cahows are vociferous fowl, as is to be expected of all petrels. The significance of their silence throughout our midwinter survey first came into mind as a result of the contrasting behavior of a pair of Audubon's Shearwaters in a small limestone niche about ten feet from a Cahow burrow. All night, and well into the following forenoon, the shearwaters kept up their mellow whistling chorus, which had the timbre and pitch of a tree-frog call. In Bermuda the old name of Audubon's Shearwater is "Pimlico" and, if the pattern of the song be put into words, it may be rendered '*ca-pímlico, ca-pímlico co-co-co-co.*'

Now the Pimlicos had perhaps just migrated back to their nesting stations. They had laid no eggs (which come in March), and their current business was courtship, as expressed by posturing and endless mutual warbling. The Cahows, on the other hand, were in the incubating phase of their reproductive cycle. To learn the song which may, as the old stories allege, make the welkin ring, an observer would need to bide with the birds at least as early as December.

Another notable contrast between Pimlico and Cahow lay in the nature of their respective nesting cavities. The shearwaters were in a crevice, with rock for the floor as well as the roof. The orifice was too small to admit a man's hand, although the chamber two feet within was larger. But the Cahows, without exception so far as our limited experience goes, had burrowed into soil or decomposed rock. The roofs might be stone but the floors were earth. Approximately level beds of such soft material were likewise a necessity; wherever the aeolian limestone strata were tilted, neither the scarp nor the dip slope offered suitable approaches for tunneling. These distinctions are important because the 17th century accounts state that the Cahow is a burrower rather than a cleft-dweller. When huge numbers inhabited flat turf-bearing surfaces available on the 75 acres of Cooper's Island, they no doubt dwelt mainly in earth burrows, whereas on the small and nearly naked islets of their last stronghold only thin flat beds of soil under layers of rock afford the slight security they retain.

While awaiting the return of our launch in the forenoon of January 30, we attempted to snare and extract Cahows with the purpose of placing Fish and Wildlife Service bands upon their legs. This was

accompanied by a regrettable accident which, nevertheless, revealed a clue to the seasonal stage in the life history of the species. One sitting Cahow held its egg between the bare brood patch on its belly and its forward-turned legs. When bird and egg were dragged out together, the egg was found to be broken. It contained an embryo estimated to be very slightly past half-term. For some time thereafter, this burrow remained deserted by both adult birds, but a month later, on March 2, the junior author had the satisfaction of finding it reoccupied.

At noon of February 2, we finally found means of inspecting a Cahow nest without continuing the risky procedure of poking into the long tunnels. At the top of a steep rock that forms almost a separate moiety of islet "A," we located a straight burrow running under a massive limestone dome. Measured with a bamboo, it proved to be 11 feet deep, but with our flashlights we could discern at the inner end both adults of a pair. By laying the fish pole along the surface above the burrow, we found that the occupants and their egg were beyond the heavy dome. It was then only a short task with a prospector's pick to pry off the roof of the actual nest chamber. One bird retreated down the tunnel toward the entrance, but the other remained on the egg until we lifted it off, and unconcernedly resumed its task as soon as we had replaced it.

The cavity was about a foot in diameter and somewhat irregular, its plan being controlled by salients of the rock. The nest itself was bulky and was made up of a profusion of soft twigs and of green and wilted leaves, all gathered from shrubbery within a few feet of the entrance. This material made a loose platform with a diameter as great as the length of the sitting bird, but in the middle of it was a tight cup of the same kind of vegetation only large enough to hold the egg itself. The brooding bird evidently turned in the nest and used the bill to rake small twigs and leaves close against its body, thus forming a true nest in the middle of a larger mat.

We finished with a careful job of shingling. Gathering slabs that had flaked away from the underlying rock, we laid them in a well-arranged mound above the chamber until the latter was quite as dark and even more rain-proof than before. It would thereafter require only a few minutes to remove the roof at any time for inspection.

On March 2, the junior author found that the chick had hatched, its probable age being about five days. At the next examination, on March 20, it had tripled in bulk. The longer down was by this time of a brownish gray, with white contour plumage beginning to show on the breast. Tips of quills were about to break through the skin of

the wings. The nestling was lively, pecking at fingers in self defense. The twigs of the nest had been matted down. As might be expected of petrels, both parents evidently remained away from their offspring during daylight hours.

THE CAHOW'S CALENDAR

Far too little is yet known about the respective durations of courtship, incubation, growth of the chick, etc., among the petrels. We

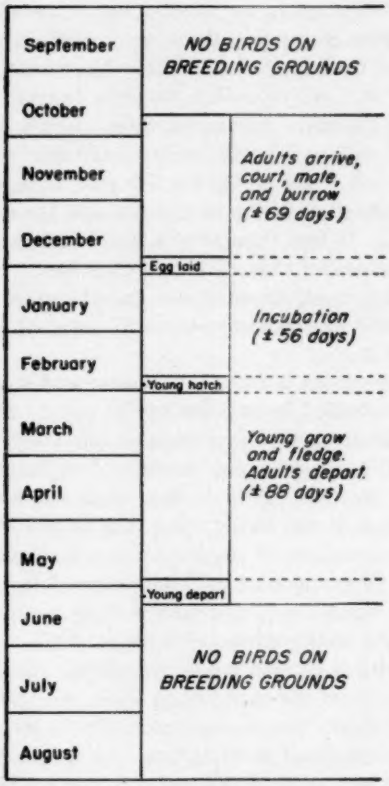
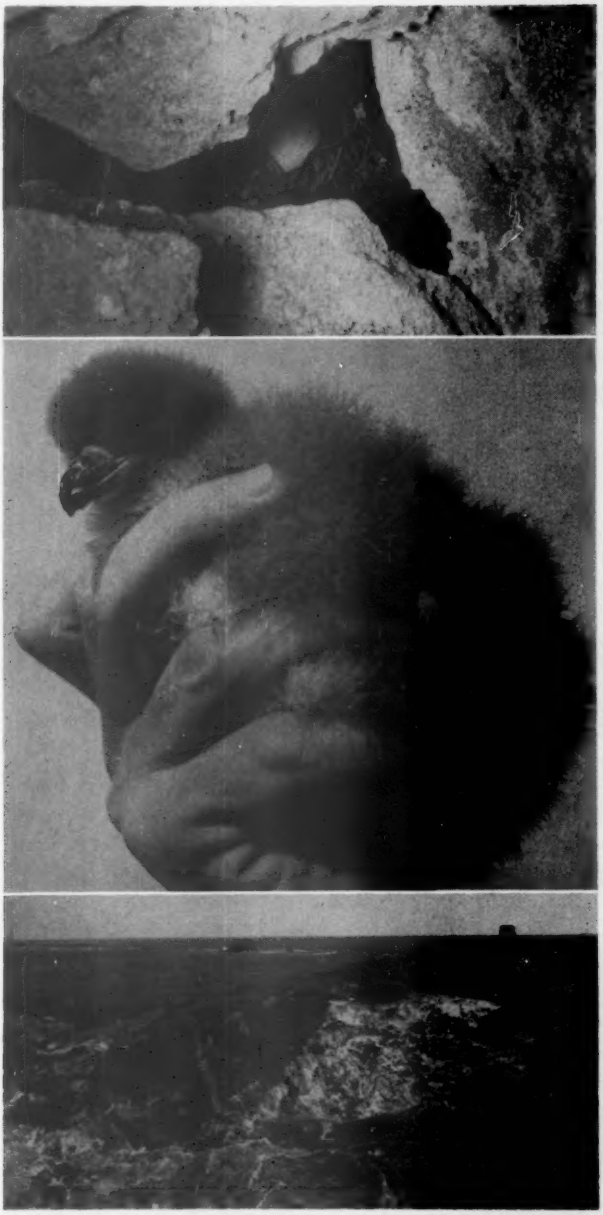


FIGURE 1. The Cahow's calendar.

have, however, certain data for species of several sizes through the field researches of Lockley (1942), Roberts (1940), Richdale (1943) and others. Bergtold (1917) also has published a brief compilation on incubation periods of the Procellariiformes.



(*Top*) NEST CHAMBER AND EGG OF A CAHOW AT THE END OF AN 11-FOOT BURROW, JANUARY 29, 1951. THIS EGG HATCHED ON OR ABOUT FEBRUARY 25. (PHOTOGRAPH BY S. L. PERINCHIEF.) (*Middle*) CAHOW CHICK WHICH HATCHED FROM THE EGG SHOWN AT TOP. PHOTOGRAPHED ON MARCH 20, 1951, AT AN APPROXIMATE AGE OF 23 DAYS. (PHOTOGRAPH BY S. L. PERINCHIEF.) (*Bottom*) GURNET ROCK, THE TYPE LOCALITY OF THE CAHOW, BEARING EASTWARD FROM CHARLES ISLAND, CASTLE ROADS. (PHOTOGRAPH BY R. C. MURPHY.)

In the case of the Cahow, assuming that its general schedule agrees with that of its relatives, we have several facts or reasonable inferences that may serve as nodal points for reconstructing a seasonal pattern of the life history. Tradition records that the petrels appear at Bermuda in autumn and that they breed in the coldest period of the year. An egg accidentally broken had passed the midpoint of incubation on January 29. A chick in a neighboring burrow, as observed by the junior author, hatched about February 25. The fledgling received by Dr. Beebe had, to judge by the down on its belly, left its nest only a day or two before June 6. We may assume that the adults abandon the young and depart on their summer exodus some 12 days before that date, or about May 24.

From such information it is possible to devise a tentative calendar (Fig. 1) subject to emendation as the species is further studied.

THE AFFINITIES OF THE CAHOW

The systematic position of the Cahow has not previously been determined. This is understandable because, so far as we can learn, only four examples have been skinned and preserved. Three of these, namely the type specimen and the birds obtained by Beebe and Hall, are before us as we write. The fourth, which struck a telephone wire in Bermuda in June, 1941, is likewise said to have been preserved as a specimen but we have been unable to locate it.

The Cahow is obviously related to *Pterodroma hasitata* of the West Indies, but not so closely that the problem may be settled by the simple process of calling it a subspecies. It seems to be equally near *Pterodroma mollis*, the typical form of which nests at the Tristan da Cunha group and Gough Island in the South Atlantic. It should be remembered that *Pterodroma mollis* has also a northern hemisphere representative at eastern North Atlantic islands from the Cape Verde group to Madeira. It might, indeed, be tempting to assume that the path of original distribution of petrels of this assemblage had been from the southern hemisphere by way of the cooler surface waters of the eastern intertropical Atlantic. By this route Bermuda lies a mere 2380 geographical miles across the Sargasso Sea from Madeira. On the other hand, the distance from the Cape Verde islands to the nearest member of the Lesser Antillean chain in the same latitude is only 2095 geographic miles. We are probably justified in assuming that the related populations of the eastern Atlantic islands, the West Indies, and Bermuda, respectively, have been segregated from one another throughout postglacial time.

The genus *Pterodroma* is made up in large part of closely related birds. Nevertheless, there are certain clearly defined natural groupings among the species. Comparison of all the known forms akin to the Cahow shows that they comprise a well-defined superspecies distributed over the greater part of the world oceans between the subtropical convergences of the northern and southern hemispheres. In other words, they are all petrels of tropical or subtropical ranges. The group is made up of the following eight forms, specific and subspecific names being here used without distinction: *hasitata* (*caribbaea*), *cahow*, *mollis*, *feae*, *phaeopygia*, *sandwichensis*, *externa*, *cervicalis*. A more detailed study of this group, which may be called the *hasitata* superspecies, is reserved for publication elsewhere.

Pterodroma cahow is a consistently smaller petrel than *Pterodroma hasitata*, except in the tail, which is disproportionately long when compared with that of either *hasitata* or *mollis*. In other respects its dimensions agree closely with those of the two recognized races of *mollis*.

From *Pterodroma hasitata* the Cahow differs markedly in two respects, first in the absence of a conspicuous white rump patch, and second in that the pileum is not distinctly darker than the back and is not separated from the back by a nuchal band of lighter feathers. From *Pterodroma mollis* the Cahow differs most strikingly in that the underwing is medially white (as in *hasitata*) instead of being prevailingly dark as in both subspecies of *mollis*.

In general appearance the Cahow might be called almost exactly intermediate between *hasitata* and *mollis*. For the present its systematic status may best be left at the specific level. Further consideration of interrelationships within the superspecies mentioned above is in preparation and will include comparative measurements of all the forms. We may here report that the dimensions of the three known specimens of *Pterodroma cahow*, one of which is a fledgling, are as follows: Total length in the flesh, 348.0–375.0 (361.5); total wingspread in the flesh, 896.6–914.4 (905.5); wing, 260.0–262.0 (260.7); tail, 118.0–123.8 (120.9); exposed culmen, 27.4–29.6 (28.6); depth of bill, in front of nostrils, 8.8–9.9 (9.4); width of maxilla at base, 12.2–14.4 (13.3); tarsus, 34.4–37.3 (35.4); middle toe and claw, 46.2–49.0 (47.1) mm.

PROTECTION OF THE CAHOW

The once spacious nesting grounds of this sea bird at Bermuda are, to all practical intents, permanently destroyed. The greatest hazard to the Cahow is the narrow margin of safety provided by its greatly

reduced numbers which are confined to small islets. The present population is perhaps of the order of 100 adult birds. There may be fewer, but there are not likely to be more.

The fact that the islets on which the birds persist are rather difficult of access, and offer little to attract visitors, is in favor of their preservation as safe nesting sites. So likewise is the great depth of the burrows, which have probably been used and, in many instances, annually deepened for long terms of years.

Unrelenting destruction of rats, which exist or have formerly existed on even relatively isolated rocks in Castle Roads, is a prime necessity. By the use of "Warfarin," "1080," or other recently developed poisons, the complete elimination of rats would be by no means impossible. If in the meanwhile the present breeding islets are kept secure, the larger insular stations, such as Castle and Nonsuch, may eventually become available for an overflow population from the smaller breeding grounds. It seems probable that the very limited situations in which the petrels can now burrow on the rocky islets have resulted in intense competition for the few safe nesting places. Since Bermuda limestone is usually much harder on the surface, after long exposure to the atmosphere, than at deeper levels, the junior author is experimenting with artificial burrows. It has proved easy to chisel openings at sites adjacent to occupied burrows and thus to put relatively soft and friable material within reach of the birds. If they take advantage of such assistance at the next breeding period, a campaign of further encouragement will be undertaken.

Happily, both public and official sentiment in Bermuda bodes well for the Cahow. "The Protection of Birds Act, 1949," which has superseded earlier legislation, effectively guards all but a few specified kinds of wild birds and their eggs. Shooting for sport has been abolished, and the privilege of scientific collecting is wisely controlled. Recommendations by the junior author, in his capacity as Curator of the Government Aquarium and Museum, are the designated legal route toward proclamations by the Governor-in-Council which establish certain areas as sanctuaries. If a suitable alteration of present circumstances may eventually enable the Cahows to spread to neighboring islands well covered with soil, the future of a beautiful and historic sea bird will be assured.

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AN ECOLOGICAL RECONNAISSANCE OF THE PHEASANTS IN HAWAII

BY CHARLES W. SCHWARTZ AND ELIZABETH REEDER SCHWARTZ

INTRODUCTION

A PERUSAL of the technical literature dealing with the pheasant shows scant reference to the introduction of this avian exotic into the Hawaiian Islands or its success as the major game bird, and no mention of the factors related to its welfare in this archipelago. The ecology of the pheasant in this adopted range is reported herein as a contribution toward a better understanding of this game bird which now provides a favorite target for gunners on three continents. The study was conducted in the Hawaiian Islands from February, 1946, through July, 1947, as part of the upland game-bird survey, Project 1-R of the Federal Aid-Wildlife Program of the Board of Commissioners of Agriculture and Forestry of the Territory of Hawaii. All the major islands were surveyed except Kahoolawe, which was used as a bombing target under military jurisdiction, and Niihau which is privately-owned.

ACKNOWLEDGMENTS

Many individuals graciously contributed to the success of this study and we regret that only a few can be acknowledged here. We are indebted to Mr. Colin G. Lennox, President, Mr. Vernon E. Brock, Director, Division of Fish and Game, and other fellow employees of the Board of Commissioners of Agriculture and Forestry of the Territory of Hawaii for their assistance in numerous ways. The owners and operators of ranches and sugar cane and pineapple plantations gave us invaluable aid.

Assistance in the identification of some specimens was given by the following: MOLLUSCS—Dr. Montague Cooke, Jr., Bernice P. Bishop Museum; PLANTS—Mr. E. Y. Hosaka, University of Hawaii and Bernice P. Bishop Museum; Dr. Harold St. John, University of Hawaii, and Mr. Gunnar O. Fagerlund, formerly of Hawaii National Park; PARASITES—Dr. Joseph E. Alicata, University of Hawaii, Drs. E. W. Baker and E. W. Stafford, U. S. Department of Agriculture, and Mr. E. Ediger, U. S. Fish and Wildlife Service; INSECTS—Mr. C. E. Pemberton, Hawaiian Sugar Planters' Association Experiment Station.

Dr. Paul H. Baldwin, formerly of Hawaii National Park, donated the crops of 18 pheasants and Dr. Robert W. Hiatt, University of Hawaii, provided four additional crops.

We are indebted, also, to Dr. Harvey I. Fisher, formerly of the University of Hawaii but now with the University of Illinois, for a critical reading of this manuscript.

HISTORICAL BACKGROUND

From the time of their discovery by the English in 1778, the Hawaiian Islands have played host to untold introductions of plants and animals. One of these, the pheasant, has taken its place as an important member of the islands' exotic fauna and, of the limited species which became established, ranks with the very few considered assets. The pheasant's popularity arises largely from its sporting value, but its plumage is also highly prized for certain feathers used in the manufacture of hatbands, or *leis*, worn for so long as an island custom that they have become a trademark of Hawaii.

At present there are two pheasants and their hybrids established in the Hawaiian Islands. The Ring-necked Pheasant, *Phasianus torquatus torquatus* Gmelin, is the more common and widespread. It was first brought to Hawaii about 1865 (Caum, 1933) but until 1941 many subsequent liberations were made on all the major islands. While direct importations from the native range of the Ring-necked Pheasant in eastern China and northern Indo-China are believed to have occurred, most of the birds for liberation and breeding purposes were obtained from dealers in the United States where the ancestry of the stock included several subspecies. The rearing of pheasants for planting on the various islands was the major function of the Territorial Game Farm until it was disbanded following the Japanese attack on Pearl Harbor in 1941. Because of the questionably-pure racial heritage, it is doubtful if the Ring-necked Pheasant occurs as a "pure" species in Hawaii, but it will be referred to by this name here because of its similarity to pure stock of the Ring-necked Pheasant.

The Green or Versicolor Pheasant, *Phasianus versicolor versicolor* Vieillot, which is believed to represent a single species in Hawaii, is less common and more restricted than the Ring-necked Pheasant. The Green Pheasant was liberated on all the major islands prior to 1900 (Caum, 1933), but subsequent plantings have been made directly from its native range on Hondo and Shikoku, Japan, from dealers in the United States, and from stock originating from these two sources which was reared at the Territorial Game Farm.

Birds possessing feather markings common to both these species occur in Hawaii, and these individuals are referred to herein as "hybrids." Unless specified otherwise, Ring-necked, Green, and hybrid pheasants will be discussed together in this paper.

Five birds showing some characteristics of the Mongolian Pheasant, *Phasianus colchicus mongolicus* J. H. Brandt, were seen or collected on Hawaii and Kauai during this survey and have been reported on Hawaii by Baldwin (1941 and MS). Such individuals probably represent hybridization between Ring-necked and Mongolian pheasants, since the latter subspecies was introduced onto these islands at various times after 1865 but no longer exists as pure stock (Caum, 1933).

Other pheasants have been brought into Hawaii on different occasions. The Silver Pheasant, *Gennaeus nycthemerus* (L.), and the Golden Pheasant, *Chrysolophus pictus* (L.), were first introduced about 1865 and 1870; in 1932 they were raised at the game farm and liberated on Oahu. The Copper Pheasant, *Syrmaticus soemmerringii* (Temminck), was planted on Oahu, Maui, and Kauai islands at various times between 1907 and 1914. The only recorded liberations of the Lady Amherst's Pheasant, *Chrysolophus amherstiae* (Leadbeater), were in 1932 on Oahu and 1933 on Hawaii. All these species failed to survive (Caum, 1933).

GEOGRAPHY

The major or windward Hawaiian Islands form the southeastern portion of the Hawaiian Archipelago and lie between 19 and 23 degrees north latitude at the northern border of the tropics. They have a combined land mass of 6,435 square miles and rise in places to a maximum height of 13,784 feet above sea level. These islands are of volcanic origin and much of their weathered surfaces possesses an extremely rugged topography. The leeward Hawaiian Islands, consisting of shoals and reefs totalling an area of only six square miles, are excluded from this discussion.

The climate of Hawaii is extremely equable, showing less than 8° F. difference in the mean temperature between the warmest and coolest months in an average year. However, above about 6,000 feet elevation, temperature fluctuations are somewhat greater. Because the temperature decreases approximately 1° F. with each 300-foot increase in elevation, concentric temperature belts are produced on each island. The climate is subtropical below 2,500 feet elevation, having an annual mean of about 75° F. Between 2,500 and 4,000 feet, it is more temperate and the annual mean is around 60° F. Frost is not infrequent at this highest elevation. From 4,000 to 7,000 feet, the mean temperature is approximately 50° F., decreasing to about 40° F. in a belt between 7,000 and 10,000 feet. Above 7,000 feet, the low summer temperatures limit good plant growth and almost no vegetation occurs above 10,000 feet (Ripperton and Hosaka, 1942). The

highest elevations in Hawaii are the summits of Mauna Loa and Mauna Kea which reach 13,680 and 13,784 feet, respectively. In winter, snow frequently blankets these peaks down to about 10,000 feet.

The northeastern trade winds, which are dominant throughout all seasons, provide rainfall for the greater parts of all islands. Maximum precipitation occurs between approximately 2,000 and 6,000 feet elevation on the windward sides, while little rain falls on leeward slopes or high mountain peaks. In lee sections most of the precipitation originates from irregularly-occurring southern and western frontal storms of a few days' duration. Throughout Hawaii, the annual rainfall varies from less than 10 inches on lee coasts to 450 inches or more in windward regions. Where the annual precipitation is less than 40 inches, conditions are semi-desert and long periods of drouth are common. In these sections the rainfall is generally torrential and it is not uncommon to have amounts nearing the total annual precipitation in a 24-hour period. Regions receiving from 40 to 60 inches annually have a more uniform distribution of rainfall throughout the year and conditions are favorable for continued plant growth and maturing of seeds. At approximately 60 inches annually, evaporation is equal to precipitation. The climate in areas receiving 60 inches or more of rainfall annually is characteristically damp and misty with little sunshine although heavy rains may occur (Territorial Planning Board, 1939; Ripperton and Hosaka, 1942; Stearns, 1946). Although comparative amounts of precipitation between regions are important, extreme variations occur from one month to another and hence the mean may have little ecological significance.

The soils of Hawaii are derived almost entirely from lava and vary from loose volcanic ash to dense lava. Because of the geologic youth of the parent material and the rugged topography, only small areas of well developed soils occur. Those soils formed under heavy precipitation are generally acid and have a large content of organic matter and nitrogen, a decreased silica content, and small amount of available potassium and phosphorus. Their plant nutrients have been depleted by leaching. The converse applies to soils formed under low precipitation (Coulter, 1940).

Only seven per cent of the land of Hawaii is under cultivation. Of this, 78 per cent is in sugar cane, 16 per cent in pineapple, and the remaining 6 per cent in coffee, taro, fruit, nuts, cotton, and vegetable gardens. Only in rare localities does cultivation occur above 2,000 feet elevation. Forest reserve, amounting to 26 per cent of the land of Hawaii, consists of large tracts kept in forest, primarily the native ohia lehua, *Metrosideros collina*, and tree ferns, *Cibotium* sp., to pro-

vide a reservoir for continued surface run-off which is the main source of water for agricultural and civic development in the islands. Waste areas, comprising 32 per cent, are generally barren lava while pasture systems, constituting 29 per cent of the land area, vary from rocky expanses with extremely poor soil and only scattered forage species to generally open grassland with good sod coverage. Civic land and National Park comprise 4 and 2 per cent of the territory, respectively (Coulter, 1940).

The Hawaiian Islands had a unique vegetation in the native state. Of 1,200 plant species recorded, 85 per cent are endemic. After the discovery of the islands in 1778 and subsequent colonization, exotic plants were introduced both intentionally and accidentally until now over 2,000 such species are known. However, the distribution of both exotic and native species falls into a general pattern which is related to climatic conditions, soil, and land-use practices. Ripperton and Hosaka (1942) have proposed "Vegetation Zones of Hawaii" which correlate the essential features of the present environment on all islands with agricultural use. The distribution and relative abundance of game birds show a general agreement with these zones, but the degree of land use is further influential. These vegetation zones are used herein in the sense of game-range types and they form the basis of the management program developed for the game birds in Hawaii. In addition to their original description by Ripperton and Hosaka (1942) they are summarized and shown on a map in connection with a discussion of the California Quail in Hawaii (Schwartz and Schwartz, 1950: 8–9).

DISTRIBUTION

The distribution of pheasants on all islands surveyed is shown on maps in Schwartz and Schwartz (1949: opp. p. 28) and given by vegetation zone in Table 1 of this paper.

All suitable range for Ring-necked Pheasants on the various islands is occupied. In Hawaii this ubiquitous species ranges: (1) from sea level to 11,000 feet elevation; (2) from subtropical regions to those where freezing temperatures occur frequently; (3) where less than 10 inches of rain falls annually to places receiving 300 inches; (4) on recent soils (lava) to those soils with deep pockets of loam; (5) in forested and grassland regions, deserts, and other waste areas; (6) in pineapple fields, sugar-cane lands, small truck gardens, and corn acreages; and (7) in all types of topographic conditions. Its best populations are found, however, on soils of better fertility where the land use permits, in areas receiving between approximately 20 and 80

TABLE 1

DISTRIBUTION BY VEGETATION ZONE OF PHEASANT RANGE IN HAWAII

	Hawaii	*Kauai*	*Lanai*	*Maui*	*Molokai*	*Oahu*	*Total*
Vegetation Zone A							
Square miles	249	23	72	121	64	67	596
Square miles occupied	73	23	72	108	64	28	368
Per cent zone occupied	29	100	100	89	100	42	62
Per cent total range	—	—	—	—	—	—	10
Vegetation Zone B							
Square miles	408	116	57	138	74	169	962
Square miles occupied	298	111	54	95	70	109	737
Per cent zone occupied	73	96	95	69	94	64	77
Per cent total range	—	—	—	—	—	—	20
Vegetation Zone C_1							
Square miles	194	88	10	54	46	146	538
Square miles occupied	126	85	9	45	40	127	432
Per cent zone occupied	65	96	90	83	87	87	80
Per cent total range	—	—	—	—	—	—	12
Vegetation Zone C_2							
Square miles	316	11	0	61	0	0	388
Square miles occupied	267	7	0	47	0	0	321
Per cent zone occupied	84	64	0	77	0	0	83
Per cent total range	—	—	—	—	—	—	9
Vegetation Zone D_1							
Square miles	464	113	2	97	32	110	818
Square miles occupied	367	113	0	73	12	83	648
Per cent zone occupied	79	100	0	75	37	75	79
Per cent total range	—	—	—	—	—	—	17
Vegetation Zone D_2							
Square miles	790	194	0	151	44	112	1,291
Square miles occupied	97	34	0	0	5	11	147
Per cent zone occupied	12	17	0	0	11	10	11
Per cent total range	—	—	—	—	—	—	4
Vegetation Zone D_3							
Square miles	353	10	0	23	0	0	386
Square miles occupied	297	10	0	23	0	0	330
Per cent zone occupied	84	100	0	100	0	0	85
Per cent total range	—	—	—	—	—	—	9
Vegetation Zone E_1							
Square miles	647	0	0	39	0	0	686
Square miles occupied	550	0	0	36	0	0	586
Per cent zone occupied	85	0	0	92	0	0	85
Per cent total range	—	—	—	—	—	—	16
Vegetation Zone E_2							
Square miles	503	0	0	44	0	0	547
Square miles occupied	94	0	0	29	0	0	123
Per cent zone occupied	19	0	0	66	0	0	22
Per cent total range	—	—	—	—	—	—	3
Vegetation Zone E_3							
Square miles	106	0	0	0	0	0	106
Square miles occupied	0	0	0	0	0	0	0
Per cent zone occupied	0	0	0	0	0	0	0
Per cent total range	—	—	—	—	—	—	0
TOTAL, *Vegetation Zones*							
Square miles	4,030	555	141	728	260	604	6,318
Square miles occupied	2,169	383	135	456	191	358	3,692
Per cent zone occupied	54	69	96	63	73	59	58
Per cent total range	59	10	4	12	5	10	

inches of rainfall annually, and in generally open cover interspersed with abundant forage species and with some form of available moisture. Areas of very heavy rainfall with associated dense rain forests, or extremely dry, barren areas at low elevations and on top of the highest mountain peaks are the only unoccupied portions of Hawaii.

According to military sources, no pheasants occur on Kahoolawe. Field observations on Niihau by Fisher (1951: 37) showed a population of Ring-necked Pheasants displaying a mixed ancestry. He described their abundance and distribution as follows: The lowlands have relatively few birds, except in the immediate vicinity of the waterholes. The open lava fields have almost none; the thickets of kiawe, *Prosopis chilensis*, present the best cover in the lowlands. The birds were abundant in the tall-grass cover on the east, south and west slopes of Kaeo, and in the indigo, *Indigofera suffruticosa*, vegetation one mile north of Kaeo. The grass and weeds of the plateau have by far the highest numbers.

The climatic conditions of the range of the Ring-necked Pheasant in Hawaii include extremes occupied by this species elsewhere in the world, except for the rigorous winters of the continents. However, the pheasant's range in Hawaii is unique in combining many variations within a small area. The high altitudes and heavy precipitation probably represent the greatest limits tolerated by this species anywhere.

The Green Pheasant is concentrated only on the windward slopes of Mauna Kea and Mauna Loa on Hawaii. Ring-necked and hybrid pheasants are also found in this area, but the population ratio is approximately 3 Green to 1 Ring-necked to 1 hybrid. Additional range occupied by Green Pheasants occurs adjacent to these areas of concentration and in isolated sites on other islands where this species was introduced. The composition of the pheasant population in such ranges is approximately 1 Green to 2 Ring-necked to 2 hybrid. Hybrids become more numerous toward the periphery of each species' concentration.

While Green Pheasants are found in all extreme elevations where Ring-necked Pheasants occur, their best range lies between approximately 4,000 and 7,000 feet elevation in vegetation zones D_3 and E_1. This area is primarily open koa, *Acacia Koa*, forest with interspersed grassy meadows containing mixed herbaceous growth. The surface here is gently sloping and the soils are better than in other portions occupied by Green Pheasants. The climate is cool and moist with an annual mean of about 50° F. Maximum rainfall is 125 inches at lower elevations and 20 inches at higher altitudes but, even in areas of

little precipitation, mists of several days' duration characterize the prevailing weather. Open grasslands, sugar cane areas, and dense forests are less productive habitats for the Green Pheasant.

Beebe (1936) described the Green Pheasant as a native of the lowlands in Japan. According to him, these birds seldom reach any great height on the ranges and mountains of the interior but seem to prefer the vicinity of cultivated fields along the coast.

The Green Pheasant is apparently decreasing in Hawaii through hybridization, and its restricted distribution and fewer numbers favor the Ring-necked Pheasant. Much of the present preferred range of the Green Pheasant is developing into open grassland through prevention of tree reproduction by heavy grazing of feral and controlled livestock. While some new range is being created by grazing in denser forests, the range of the Green Pheasant will probably always be less than that of the Ring-necked Pheasant in Hawaii.

From all indications, both Ring-necked and Green pheasants tend to remain in the same vicinity throughout the year. In areas subjected to prolonged drouth we have found that birds may move to regions where water or succulence is available, and in extremely high elevations during colder months they tend to move down to about 8,000 feet elevation.

POPULATIONS

A population of 70,000 pheasants was estimated for 3,700 square miles of range in the major Hawaiian Islands. Population densities vary from less than 10 to 100 birds per square mile. Estimates of populations for 1946–1947 are given by vegetation zone in Table 2. Average densities have not been computed because they do not show the span or frequency of densities within a given range and are of little value in range evaluation.

Evaluation of vegetation zones for pheasant productivity on the basis of size of population, area occupied, and amount of range with high densities shows four general groups: (1) zones B, C_2, D_1, and E_1 rank highest in all three respects; (2) zones D_2 and E_2 rate lowest, and zone A, although having more occupied range, has low densities and a low population; (3) zones C_1 and D_3 are intermediate; and (4) zone E_3 is unoccupied.

Two methods were utilized to estimate the pheasant population. A count of crowing males was taken during the height of the breeding season on Hawaii, Kauai, and Oahu. Our method was developed independently but is similar to the crowing-count pheasant census described by Kimball (1949). This count was converted into a census

TABLE 2

POPULATIONS OF PHEASANTS IN HAWAII BY VEGETATION ZONE

	Total population	Distribution of density classes in birds per square mile							
		1–10		11–25		26–50		51–100	
		Miles	Per cent	Miles	Per cent	Miles	Per cent	Miles	Per cent
Vegetation Zone—A									
Hawaii	670	68	93	5	7				
Kauai	460			23	100				
Lanai	430	70	97	2	3				
Maui	1,160	51	47	57	53				
Molokai	640	64	100						
Oahu	400	23	82			5	18		
Total	3,760	276	75	87	24	5	1		
Per cent population	5								
Vegetation Zone—B									
Hawaii	4,430	201	68	57	19	28	9	12	4
Kauai	2,890	19	17	50	45	36	33	6	5
Lanai	890	21	39	13	24	20	37		
Maui	1,540	8	8	87	92				
Molokai	870	51	73	14	20	5	7		
Oahu	2,000	32	29	59	54	18	17		
Total	12,620	332	45	280	38	107	15	18	2
Per cent population	18								
Vegetation Zone—C_1									
Hawaii	1,240	113	90			13	10		
Kauai	2,610	10	12	8	9	67	79		
Lanai	130	5	56	1	11	3	33		
Maui	1,130	4	9	10	22	31	69		
Molokai	580	30	75	2	5	8	20		
Oahu	2,720	6	5	103	81	18	14		
Total	8,410	168	39	124	29	140	32		
Per cent population	12								
Vegetation Zone—C_2									
Hawaii	8,060	122	46	69	26	43	16	33	12
Kauai	150	6	86	1	14				
Lanai	0								
Maui	2,230			6	12	41	88		
Molokai	0								
Oahu	0								
Total	10,440	128	40	76	24	84	26	33	10
Per cent population	15								
Vegetation Zone—D_1									
Hawaii	1,910	366	100			1	trace		
Kauai	4,620	7	6	21	19	66	58	19	17
Lanai	0								
Maui	2,160	19	26	1	1	53	73		
Molokai	230	3	25	4	33	5	42		
Oahu	1,820			66	80	17	20		
Total	10,740	395	61	92	14	142	22	19	3
Per cent population	15								
Vegetation Zone—D_3									
Hawaii	1,520	43	44	37	38	17	18		
Kauai	610			30	88	4	12		

TABLE 2—(*continued*)

	Total population	Distribution of density classes in birds per square mile							
		1–10		11–25		26–50		51–100	
		Miles	Per cent	Miles	Per cent	Miles	Per cent	Miles	Per cent
Vegt. Zone—D_3 (cont.)									
Lanai	0								
Maui	0								
Molokai	90	1	20	3	60	1	20		
Oahu	220			11	100				
Total	2,440	44	30	81	55	22	15		
Per cent population	4								
Vegetation Zone—D_2									
Hawaii	4,910	157	53	74	25	66	22		
Kauai	200			8	80	2	20		
Lanai	0								
Maui	1,250					20	87	3	13
Molokai	0								
Oahu	0								
Total	6,360	157	47	82	25	88	27	3	1
Per cent population	9								
Vegetation Zone—E_1									
Hawaii	10,870	271	49	136	25	112	20	31	6
Kauai	0								
Lanai	0								
Maui	1,670			7	19	29	81		
Molokai	0								
Oahu	0								
Total	12,540	271	46	143	25	141	24	31	5
Per cent population	18								
Vegetation Zone—E_2									
Hawaii	1,580	46	49	39	41	9	10		
Kauai	0								
Lanai	0								
Maui	1,450					29	100		
Molokai	0								
Oahu	0								
Total	3,030	46	37	39	32	38	31		
Per cent population	4								

	Total population	Per cent total population	Distribution of density classes in birds per square mile							
			1–10		11–25		26–50		51–100	
			Miles	Per cent	Miles	Per cent	Miles	Per cent	Miles	Per cent
All Zones—Total										
Hawaii	35,190	50	1,387	64	417	19	289	13	76	4
Kauai	11,540	17	42	11	141	37	175	46	25	6
Lanai	1,450	2	96	71	16	12	23	17		
Maui	12,590	18	82	18	168	37	203	44	3	1
Molokai	2,410	3	149	78	23	12	19	10		
Oahu	7,160	10	61	17	239	67	58	16		
Total	70,340		1,817	49	1,004	27	767	21	104	3

figure by using the sex ratio obtained from sight observations in the same area in early morning or evening. The islands of Maui, Lanai, and Molokai were censused following the height of the breeding season by strip counts made with and without dogs, and on foot and horseback. The limitations of these methods are realized, but our estimates agree closely with those of informed observers in the areas.

Compared to the Ring-necked Pheasant, crowing of the Green Pheasant is distinctly higher and shriller, as first pointed out by Beebe (1936); the crow of the hybrid tends to resemble that of the species which its plumage portrays. However, the relative abundance of these three types was based upon sight observation rather than on auditory means because the listener could not always distinguish the fine demarcation in the crowing of these different birds.

FOODS

The crops and gizzards of 191 pheasants taken from the nine occupied vegetation zones formed the basis for this food study. Identification of food items was done in the field and, although the time thus spent limited the size of the sample, the on-the-spot analysis provided valuable information for concurrent range evaluation and permitted a sufficiently accurate picture of foods in the better pheasant ranges. The food items were separated, identified, dried, measured volumetrically in cubic centimeters, totalled for respective vegetation zones by aggregate volume, and recorded as to frequency of occurrence. In order to provide a measure of food plants in the range, the various foods were assigned to three arbitrary classes—classes 1, 2, and 3—on the basis of volumes in crops by vegetation zone. It was found that the foods of pheasants were related to the plant distribution and availability by vegetation zone, rather than to any seasonal occurrence, because of the little variation in the growing season in most of Hawaii.

Table 3 gives the annual foods, by food class, of pheasants in all vegetation zones of Hawaii. A total of 152 foods was utilized; 97 were plant species and 55 animal items. The wide variety of foods which the pheasant eats illustrates the adaptability of this bird to the different habitat conditions in Hawaii.

Class 1 foods include all species which occurred as more than six per cent of the crop volume in any vegetation zone. In this class there are 23 plant species and 5 insects. Class 2 foods, including 15 plant species and 9 animal items, occurred as 1 to 6 per cent of crop volumes. These two classes are important because of their volumes in the diet.

TABLE 3

FOODS OF PHEASANTS IN ALL VEGETATION ZONES BY FOOD CLASS[1]

Species	Food class by vegetation zone								
	A	*B*	C_1	C_2	D_1	D_2	D_3	E_1	E_2
PLANTS									
Acacia Koa							2	3	
Anagallis arvensis				3	3				
Ananas comosus		1							
Basidiomycete (unid.)								3	
Bidens pilosa		2							
Bromus catharticus		3		1				3	1
Capsicum frutescens					3				
Carex wahuensis								2	
Cassia bicapsularis	G	G							
Cassia Leschenaultiana		3	G		3				
Chenopodium ambrosioides				2					
Chenopodium oahuense				3					
Cirsium vulgare				1				2	
Colocasia esculenta					2				
Coprosma ernodeoides var. *typica*								G	
Coprosma montana var. *typica*							G		
Coprosma rhyncocarpa							G	G	
Crotolaria mucronata					3				
Cynodon Dactylon		3							
Desmodium canum					2				
Desmodium tortuosum				2					
Desmodium uncinatum		G		3					
Dianella sandwicensis							1		
Diospyros ferrea		3							
Dodonaea viscosa		G		3			3	G	G
Eleusine indica		3							
Emilia sonchifolia					3				
Eragrostis grandis								G	
Erigeron albidus		3							
Eugenia Cumini			1		1				
Euphorbia geniculata					3				
Euphorbia hirta				3				3	
Euphorbia hypericifolia	3				3				
Fragaria grandiflora		3							
Galinsoga parviflora		1		3					
Geranium carolinianum var. *australe*				3			3	3	
Geranium cuneatum var. *hypoleucum*				3					
Holcus lanatus							3		
Hypochaeris radicata		3		1			1	1	
Indigofera suffruticosa		G		G					
Ipomoea Batatas		1							
Korthalsella sp.							3		
Lantana Camara	1	G	1		3				
Lepidium auriculatum								3	1
Leucaena glauca	G	G	G					G	
Linum usitatissimum								3	
Lolium multiflorum				3				2	
Lythrum maritimum							3		
Medicago hispida		G							
Medicago lupulina				G	3			3	
Melilotus indica							G		
Merremia aegyptia	G	G							

TABLE 3—(*continued*)

Species	Food class by vegetation zone								
	A	*B*	C_1	C_2	D_1	D_2	D_3	E_1	E_2
PLANTS—(*continued*)									
Mimosa pudica			3		1				
Myoporum sandwicense							G	3	
Myrica Faya							1		
Nicandra Physalodes		3							
Opuntia megacantha		3		3					
Osteomeles anthyllidifolia		G							
Oxalis corniculata		2		3	3		G	2	
Oxalis Martiana			1		2				
Paspalum Urvillei		3			3		3		
Passiflora edulis					1		2		
Pellaea ternifolia								G	
Physalis peruviana								3	
Poa pratensis							3		
Prosopis chilensis	1	3							
Psidium Guajava		G	G		1				
Richardia brasiliensis					3				
Rubus hawaiensis							G	G	
Rubus rosaefolius					G	G	3	2	
Rumex acetosella							G	2	
Rumex crispus							G		
Scaevola procera		G					2		
Setaria geniculata		3					3		
Siegesbeckia orientalis					1				
Silene gallica				3				3	
Solanum nodiflorum	1	1			1		3	2	
Solanum Pseudo-Capsicum								sight	
Sonchus oleraceus	3	2		3	3			2	2
Sophora chrysophylla								3	
Sporobolus capensis		3		1	2		3	3	
Sporobolus indicus							3		
Stellaria media							3	3	
Styphelia Tameiameiae		G						1	
Tephrosia purpurea		3							
Trifolium repens		2		1	3		1	2	G
Tritonia crocosmaefolia					2				
Tropaeolum majus							1		
Vaccinium reticulatum								3	
Verbena litoralis							G	3	
Verbesina encelioides	3								
Vicia sativa				3	3			3	
Vigna marina					3				
Waltheria americana		3							
Wikstroemia phillyraefolia		1		1					
Xanthium saccharatum					3				
Zea mays		3		2	2				
ANIMALS									
Agriolimax sp.								3	
Agrotis ypsilon		2		2			2	1	1
Antonina graminis				3					
Aphodius lividus	1			3	3			3	
Arachnida (unid.)		3		3				3	
Atractomorpha ambigua		3			1				
Blapstinus dilitatus	2	3		2	3			3	
Blattidae (unid.)					3				
Bradybaena similaris				3					

TABLE 3—(*continued*)

Species	Food class[1] by vegetation zone								
	A	*B*	C_1	C_2	D_1	D_2	D_3	E_1	E_2
ANIMALS—(*continued*)									
Bruchus prosopis					3				
Carpophilus hemipterus		3							
Chaetogaedia monticola								3	
Chrysomia megacephala				G					
Cirphis unipuncta				G				2	
Coelophora inaequalis		3						3	
Coleoptera (unid.)	G	3		G			3	G	
Conoderus exsul		3		3	3	G		3	
Conocephalus saltator				3	2	1			
Copris incertus prociduus					3				
Curculionidae (unid.)								G	
Cutilia soror		3							
Diploptera dytiscoides		G	1	3					
Diptera (unid.)	3			3				G	
Elateridae (unid.)								G	
Epitragus diremptus	3								
Euborellia annulipes		2		3	3			G	
Fulgoridae (unid.)		3							
Gastropoda (unid.)				3					
Geotomus pygmaeus				3					
Gonocephalum seriatum		3			3			3	
Graptostethus manilensis	2							3	
Hemiptera (unid.)		3							
Homoptera (unid.)								G	
Insecta (unid.)				G				3	
Lepidoptera (unid.)	G			3			G	3	
Listroderes obliquus								G	
Megacerus alternatus	2								
Nysius coenosulus		G		3				3	
Oechalia pacifica							3		
Onthophagus insensus				2				3	
Orthoptera (unid.)							G		
Oxidus gracilis				3					
Oxya chinensis					3				
Pantomorus godmani		3		2	2	3		3	
Physa sp.								G	
Porcellio sp.		3		3				3	
Pseudoamblyteles koebelei					3			3	G
Pycnoscelus surinamensis	2	3							
Rodentia				G					
Sarcophagidae (unid.)		3		3				3	G
Siphanta acuta		3							
Sphaeridium scarabaeoides				3				3	
Succinea konaensis				3					
Xenocrabro polynesialis								3	
Total crops	8	22	4	50	30	1	13	60	3
Total crops with measurable volumes	8	18	3	45	29	1	10	44	3
Total crops with traces	0	0	0	3	1	0	2	13	0
Total crops empty	0	4	1	2	0	0	1	3	0
Total gizzards	8	21	2	20	7	1	13	55	1

1. Food Class 1 = Above 6 per cent
Food Class 2 = Between 1 and 6 per cent
Food Class 3 = Below 1 per cent
G = Occurrence in gizzard only

Class 3 foods occurred as less than one per cent of the diet and included 59 plant species and 41 animals. These are considered less important here than the other two classes because of their small volumes, but they may be significant by other criteria such as serving as intermediate hosts for internal parasites or providing available and necessary nutrients.

Nine arthropods eaten by the collected pheasants are the intermediate hosts for parasites affecting pheasants or domestic poultry in Hawaii. These intermediate hosts and parasites are further discussed in the section on parasites and predators.

The consumption of living snails as well as their empty shells, although not in large volume, may be related to the reproductive requirements of females by providing a source of available calcium. Two species of snails, *Bradybaena similaris* and *Succinea konaensis*, were found only during March, April, and May in the crops of 7 breeding females; 25 males collected during these same months contained none. Pheasant egg shells in the crops of two laying females and a small sliver of rodent bone in the gizzard of one of these birds presumably also supplied calcium. Others have reported a similar preference for snails or egg shells by breeding female pheasants in the United States (Swenk, 1930; Fried, 1940; Sharp and McClure, 1945; Hiatt, 1946).

The only report of foods eaten by pheasants in Hawaii is by Munro (1944) who cited them as feeding upon "dandelion heads, sweet potatoes, guava fruit, pigeon peas, leaves of certain plants, cockroaches, caterpillars, etc."

Food Types.—Figure 1 presents pheasant food types classified as to fruit, browse, seeds, and animal matter by vegetation zone. Only crops with measurable volumes were utilized. Pheasants taken from C_1, D_2, and E_2 were omitted because the sample was too small.

In general, pheasants select a diet in all zones corresponding to the availability of food types. Animal matter, taken in largest volume in zone A and in smallest amount in D_3, consisted chiefly of insects. These were eaten throughout the year. Adults, larvae, nymphs, and certain pupae and egg cases were taken. Other types of arthropod foods included crustaceans, spiders, and millipedes.

Seeds are eaten in largest volume in zone C_2; with insects they probably furnish much protein. Apparently, leafy matter and fruit supplement each other (as indicated in zones A and E_1) by providing moisture, especially in dry areas.

In cultivated sections such as pineapple fields, small truck farms, and corn acreages, pheasants utilize both planted crops and weeds

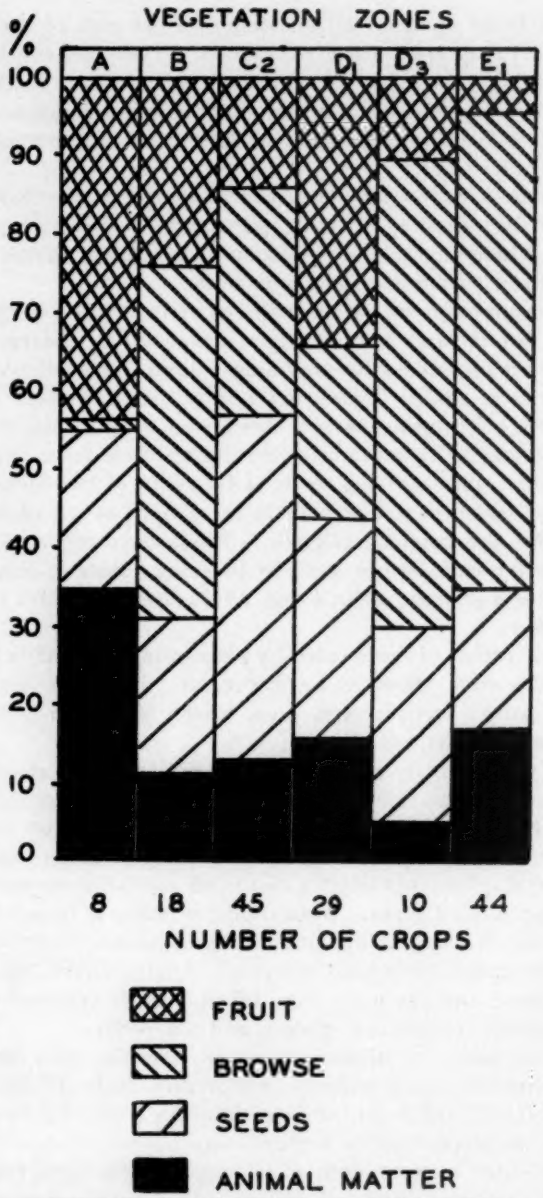

FIGURE 1. Foods of pheasants by vegetation zone.

responding to cultivation. In pasture areas both planted grasses and legumes occur in the diet, as well as herbaceous species which become established as a result of grazing pressure. Pheasants are destructive only locally where they damage some truck crops, principally sweet potatoes, tomatoes, and sprouting corn.

Pheasants in the United States also take a wide variety of foods, but they are highly granivorous where such food is plentiful. Cultivated foods constitute the majority of the annual dietary and amount up to 87 per cent in agricultural areas. Weed seeds are substituted where cultivated grains are lacking. Leafy matter is relatively unimportant in most grain areas but occurs more frequently in the diet where grain is absent, and especially in late winter. Only small amounts of fruit are taken; during winter this source is considered an emergency food. Animal matter varies from 2 to 25 per cent (Dalke, 1937; Fried, 1940; Cowan, 1942; Einarsen, 1945; Hiatt, 1946; Ferrel, Twining, and Herkenham, 1949).

Food habits of pheasants in Hawaii differ considerably from those in the United States, possibly because of climatic and vegetative differences. In Hawaii, pheasants utilize cultivated grain where available, but over the range as a whole this source of food is negligible.

There is little competition for food between the pheasant and the California Quail, *Lophortyx californica*, where they occupy the same range in Hawaii, because the few foods they share in any quantity are abundant. Pheasants show a preference for larger seeds, fruits, and more insects while California Quails select smaller seeds, more leafy browse, and fewer insects (Schwartz and Schwartz, 1950). Pheasants, Feral Pigeons, *Columba livia*, Jungle Fowls, *Gallus gallus*, and Lace-necked Doves, *Streptopelia chinensis*, all utilize the fruits of: ukiuki, *Dianella sandwicensis;* akia, *Wikstroemia phillyraefolia;* and popolo, *Solanum nodiflorum*, in large amounts (Schwartz and Schwartz, 1949). In dry areas or during dry periods this competition might be significant.

Foods of chicks.—The foods of five chicks are given in Table 4. The species eaten are the same as those taken by adults except for one plant, *Ipomoea* sp., taken only by the chicks. The crops of four chicks collected in zone E_1 showed 99.5 per cent animal matter while 12 older birds taken at the same time and place as the chicks showed 28.4 per cent animal matter. However, the chick taken in zone B showed only 6.2 per cent animal matter. A preponderance of animal food is selected by very young birds in the United States (Dalke, 1935; Einarsen, 1945; Pearce, 1945; Rasmussen and McKean, 1945; Ferrel, Twining, and Herkenham, 1949).

TABLE 4

FOODS OF PHEASANT CHICKS BY VEGETATION ZONE

	Zone B		*Zone E_1*	
Total Crops	1		4	
Crops with measurable volumes	1		3	
Crops with traces	0		0	
Crops empty	0		1	
Total Gizzards	1		1	
	Per cent crop volume	*In gizzard*	*Per cent crop volume*	*In gizzard*
PLANTS				
Ananas comosus	93.8			
Tephrosia purpurea	T			
Ipomoea sp.		x		
Vicia sativa			0.5	
Cirsium vulgare			T	
Lolium multiflorum				x
TOTAL PLANTS	93.8		0.5	
ANIMALS				
Carpophilus hemipterus	6.2			
Agrotis ypsilon			69.0	
Pantomorus godmani			12.2	
Gastropoda (unid.)			11.6	
Chaetogaedia monticola			2.3	
Sarcophagidae (unid.)			1.7	
Conoderus exsul			1.1	
Onthophagus insensus			1.1	
Nysius coenosulus			0.5	
Arachnida (unid.)			T	
Coleoptera (unid.)				x
TOTAL ANIMALS	6.2		99.5	

Grit.—Angular or well-rounded fragments of basalt, olivine, feldspar, bottle glass, opaline, and coral, ranging from one to five millimeters in diameter and averaging a total of 2.5 cubic centimeters per gizzard, were found in 101 gizzards; 27 gizzards had no grit, and 9 showed only traces (including nine not used in the food analysis). Similar types of grit averaging a total of 0.9 cubic centimeters per crop were recovered from five crops. One additional crop contained 4.5 cubic centimeters of charcoal, and two others showed pellets of dried earth averaging 16.5 cubic centimeters. Ample grit is available in Hawaii.

The hard seeds of puakeawe, *Styphelia Tameiameiae*, in zone E_1 and common vetch, *Vicia sativa*, in zone C_2 occurred statistically more often in gizzards than crops. In these two zones, grit occurred more abundantly in gizzards than in other zones with comparable amounts of seeds but of different species. It seems possible to us that more grit is required for the utilization of hard seeds although, Beer and Tidy-

man (1942) report grit to occur in inverse proportion to the volume of hard seeds.

In Michigan, Dalke (1938) found more grit in breeding females than in males and believed it was related to egg production. In Hawaii, more grit occurred in both males and females during the breeding season than at other times.

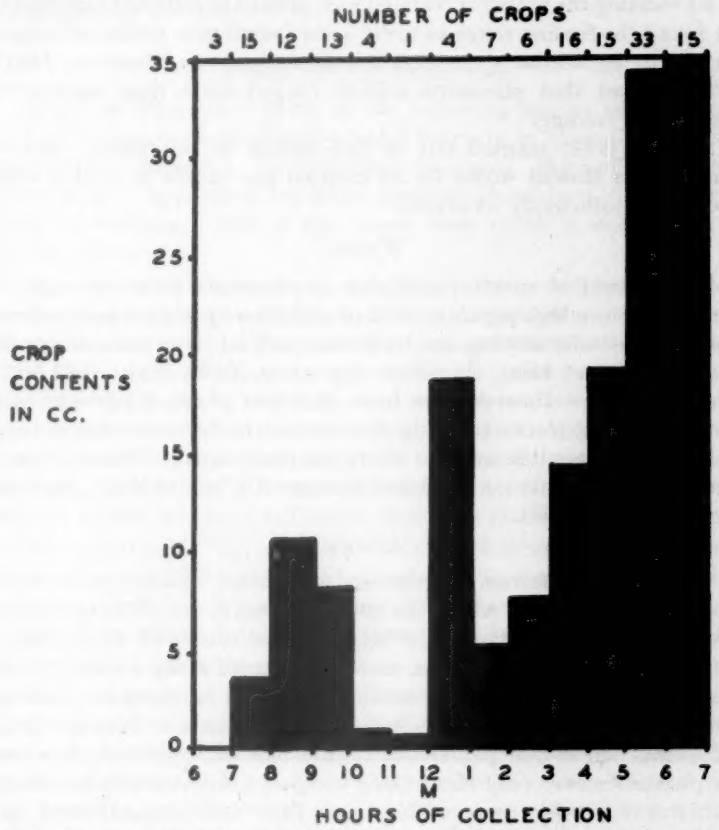

FIGURE 2. Food volumes in crops of pheasants collected at different times of the day.

Feeding Habits.—Figure 2 shows the amount of food in the crops of 144 pheasants with relation to the hour of collection. Apparently little feeding takes place during the first hour after awakening, and only small amounts are taken during the next three hours. From approximately 10 a. m. until noon, feeding almost ceases but after-

wards increases somewhat until about 5 p. m. From then until dark, feeding is greatly accelerated, and most birds go to roost with full crops. Forty-eight birds collected between 5 and 7 p. m. showed an average crop volume of 34.9 cubic centimeters; the maximum was 206.0 cubic centimeters. This general pattern of feeding agrees with reports in the United States (Dalke, 1937; Hiatt, 1946).

By locating the source of certain foods present in collected pheasants, we found the feeding range to cover a one-fourth mile radius, although mostly it lay within a one-eighth mile radius. In Montana, Hiatt (1946) found that pheasants seldom ranged more than one-fourth mile during feeding.

Munro (1944) pointed out (a fact salient in this study) that a pheasant in Hawaii would fill its crop on one article of food if that food were sufficiently available.

WATER

The amount of moisture available to pheasants varies throughout Hawaii. Since high populations of pheasants may occur where surface water is generally lacking, the birds must subsist on occasional dew or mist, infrequent rains, succulent vegetation, fleshy fruits, and soft-bodied insects. However, we have observed pheasants frequenting cattle watering places and irrigation ditches in dry areas where they utilized the accessible water. There are many areas in Hawaii where the pheasant population is limited because of a lack of water or moisture-providing foods.

COVER

Pheasants in Hawaii, in common with other upland game birds, respond best to areas where the cover pattern is one of interspersion and variety rather than uniformity. Dense stands of vegetation—whether heavily-forested areas, uniform expanses of sugar cane, guava, *Psidium Guajava*, cactus, *Opuntia megacantha*, or *Lantana Camara*, or gullies, draws, or slopes choked with such plants as staghorn fern, *Gleichenia linearis*, or pamakani, *Eupatorium adenophorum*—function as pheasant cover only along their margins. Areas under pineapple cultivation provide more usable cover than their extensiveness and uniformity would lead one to suppose because of numerous margins created by roadways. Grassland in open expanses tends to favor pheasants more than do these other vegetative types but provides its optimum cover where herbaceous and brushy growth is interspersed.

Pheasants roost both on the ground and in trees. Where trees are available, the birds seemingly prefer them at any season of the year. Medium-sized, densely-foliaged trees function best. In areas where

trees are sparse, pheasants roost on the ground in grassy cover. Young birds roost on the ground until capable of flight.

Because of the year-around growing season in Hawaii, there is no critical winter period without suitable cover, which is often a deciding factor in the success of pheasants in the United States. However, in both regions, the dispersal of desirable cover is related to maximum production of the range.

PARASITES AND PREDATORS

Arthropod Parasites.—Mites of the following species were present in light infestations on Ring-necked Pheasants in Hawaii: ***Megninia ginglymura*** (Megnin), ***Raphignathus*** sp., and ***Megninia columbae*** (Buchholz). Apparently the latter species is uncommon on pheasants, since its customary host is the pigeon from which it was recovered during our survey.

Two species of lice occurred on collected Green and hybrid pheasants, ***Lipeurus maculosus*** Clay, and ***Menopon fulvomaculatum*** Denny. These also occurred on Ring-necked Pheasants which had in addition the following species: ***Lipeurus caponis*** (L.), ***Goniodes colchici*** Denny, ***Goniodes*** sp., larva, ***Uchida*** sp., and ***Goniodes mammilatus*** Rudow. All infestations were light or moderate. ***L. caponis*** which we found on Jungle Fowl in Hawaii is reported also on domestic poultry in Hawaii (Alicata, 1947). ***M. fulvomaculatum*** and ***G. mammilatus*** occurred likewise on California Quail in Hawaii (Schwartz and Schwartz, 1950).

The hippoboscid fly, ***Ornithoica vicina*** (Walker), was recovered from only three Ring-necked Pheasants. The same species likewise occurred rarely on Japanese Quail, ***Coturnix coturnix japonica***, and Jungle Fowl collected during this survey. It is not known if this fly harbors blood parasites.

Helminth Parasites.—The eyeworm, ***Oxyspirura mansoni*** (Cobbald), was commonly found in Ring-necked Pheasants taken below 3,000 feet elevation. ***Pycnoscelus surinamensis*** (L.) or burrowing roach, the intermediate host of this parasite (Alicata, 1947), occurred in the diet of pheasants in these low elevations. The heaviest infestation consisted of 17 worms in each eye of a single bird, but in no bird that we examined did this parasite cause obvious harm. This eyeworm is common in poultry in Hawaii and has been reported in the Lace-necked Dove here (Alicata, 1947). We also found it in this dove and in the Japanese Quail—a new record of occurrence. Eyeworms, ***Oxyspirura petrowi***, have been reported in 40 per cent of the pheasants in north-central Nebraska (McClure, 1949).

Cheilospirura hamulosa (Diesing), the gizzard worm, was found occasionally in Ring-necked Pheasants. Known intermediate hosts listed by Alicata (1947) and found in our food studies to be eaten by pheasants are: *Gonocephalum seriatum*, *Conocephalus saltator*, *Oxya chinensis*, *Epitragus diremptus*, and *Atractomorpha ambigua*. This helminth parasite is believed responsible for anemia, emaciation, and deaths of island chickens (Alicata, 1947), but we have no evidence that it adversely affects pheasants.

Subulura brumpti (Lopez Neyra), the cecal worm of island poultry, occurred commonly in the Ring-necked Pheasant which served as a new known host for this species. The following arthropods eaten by pheasants are listed by Alicata (1947) as intermediate hosts of this parasite: *Gonocephalum seriatum*, *Conocephalus saltator*, *Oxya chinensis*, and *Euborellia annulipes*. We also found this parasite in other new hosts in Hawaii, the Japanese Quail and the Lace-necked Dove. It is probably of little economic importance.

Heterakis gallinae (Gmelin), another cecal worm common in island chickens, was recovered from Ring-necked, Green, and hybrid pheasants. This parasite requires no intermediate host. Since it is the known carrier of the causative agent of blackhead, this latter disease might result. In Oregon, *H. gallinae* occurred rarely in pheasants (Einarsen, 1945), but in pheasants in Ohio it was more common (Leedy and Hicks, 1945).

Cyrnea graphophasiani Yamaguti, a gizzard worm, occurred in only one pheasant, but *Cheilospirura hamulosa* was also present in the gizzard of this bird. The pheasant is a new host for *C. graphophasiani* and apparently the second host species reported.

Ascaridia sp., possibly either *A. lineata* or *A. perspicillum*, was found in only one Ring-necked Pheasant.

Certain other parasites not found in pheasants, but which infect island poultry and use as intermediate hosts arthropods which were eaten by pheasants, indicate their potentialities as parasites of pheasants.

Predators.—The mongoose, *Herpestes javanicus auropunctatus* (Hodgson), which occurs only on the islands of Hawaii, Maui, Oahu, and Molokai, is probably the most important predator upon pheasants in Hawaii. In an analysis of 86 scats we collected from the island of Hawaii, bird feathers constituted only four per cent of the food. However, this is scarcely indicative of the true volume of bird food consumed, since in feeding the mongoose usually takes the soft parts such as brain, blood, viscera, and contents of eggs. These items are not apt to show up in a scat analysis. Pheasant poult feathers were

the only evidence of predation upon pheasants from this scat analysis, but mongooses have been discovered feeding on pheasant eggs at the nest. Cock pheasant remains have been found in mongoose dens, but these could easily have been birds killed or crippled during the hunting season which just preceded these observations. Freshly-killed and dissected pheasants were taken on six occasions from our camp by mongooses, all in plain sight of the observers. However, no great difference exists with respect to densities of pheasants between islands having mongooses and those without mongooses.

Rats, feral cats, feral pigs, and fire ants, *Solenopsis* sp., are other predators which may be important in certain localities but evidence of their take is very scanty. The Hawaiian Hawk, *Buteo solitarius* Peale, exists in such few numbers as to be of little influence as a winged predator. While the Hawaiian Owl, *Asio flammeus sandwichensis* (Bloxam), is more numerous than the Hawaiian Hawk, its small numbers make it negligible as a potential predator. Approximately 75 regurgitated food pellets of this owl were examined during this survey and all consisted of mouse, *Mus musculus*, and rat, *Rattus* sp., remains. We believe the pheasant population in Hawaii reflects the quality of its environment with respect to food, cover, water, and climate, rather than the probable effect of predators.

Pheasants probably suffer more from illegal kill than all other game bird species on the islands. The out-of-season take consists mostly of cocks whose brilliant plumage is used in making feathered *leis*. However, this toll is less serious than the willful illegal take of hens during the open season.

BREEDING

Observations on gonadal size and development in collected pheasants indicate one annual period of reproductive activity. Figure 3 presents by months the distribution and average of testis size in cubic millimeters for 54 collected pheasants. This size was roughly computed by multiplying average length by width by depth of both testes per individual. The only male we collected in January had testes averaging 121 cubic millimeters. Four others collected by Hiatt (1945) on Hawaii from January 20 to February 5 were of a similar small size. Increase in testis size probably starts in February, because in March testes showed a great increase in volume over January and reached an average of 7,200 cubic millimeters. This large size generally continued in April and increased to a maximum of 7,500 cubic millimeters in May. The development of the testes was presumably accompanied by formation of spermatozoa since volumetric changes reported

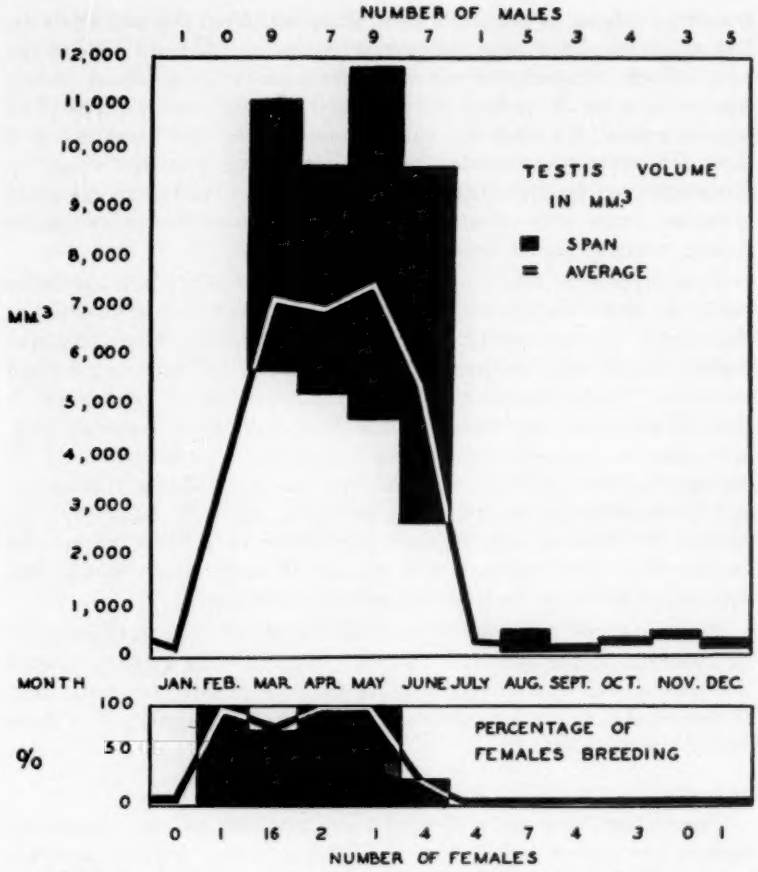

FIGURE 3. Breeding season of pheasants as indicated by testis volumes and maturing Graafian follicles.

herein compare favorably with weight changes that Hiatt and Fisher (1947) correlated with spermatogenesis in the testes of wild pheasants in Montana. Testes taken in June showed a decrease in average size to 5,400 cubic millimeters, followed in July by a great reduction to a relatively small size (275 cubic millimeters) which was generally maintained until about February. In Montana, testes are without sperm after early August (Hiatt and Fisher, 1947) and this perhaps applies to pheasants in Hawaii.

The percentage of females breeding (determined by the presence of maturing Graafian follicles) is given by month for 43 females in Figure 3. The only female we took in February had a fully-formed egg in her oviduct, but five females collected from January 20 to February 5 on Hawaii by Hiatt (1945) showed no or only slight gonadal development. In March, 14 of 16 collected hens were breeding and 13 of these were laying; those two not breeding were collected on March 1 and 2 and might have come into breeding condition later in the season. In April, one of two females collected was laying; the other showed maturing Graafian follicles. The one female collected in May showed yolky Graafian follicles. In June, only one of four females collected was laying; ovaries of the other three indicated previous ovulation. From July through December, ovaries contained no yolky follicles.

General crowing of the males begins in late January or early February, although crowing is occasional previously. Courtship is most pronounced from early February through March. From observations on the general behavior pattern of pheasants in the spring and on broods, supplemented by the gonadal development shown in our limited study, we believe that general laying begins early in March. In 55 observed or reported nests, the eggs numbered from 6 to 11. Incubation takes place mostly during April and May, and hatching occurs from early May through June. However, some birds breed earlier or later than the majority of the population, as indicated by a brood about one week old which was seen on March 7 and a young bird about six weeks old which was observed the last of October. No evidence was obtained that more than one brood per female was produced during the breeding season. There may be a revival of crowing in the fall, but it is not as intensive or lengthy as in the spring and no breeding ensues.

In Montana and other sections of the United States, laying females are usually found from mid-April to mid-July (Hiatt and Fisher, 1947). Thus, laying in Hawaii begins about six weeks earlier than in the United States, which may be related to differences in latitude of these different habitats. We have no information concerning any differences in initiation of breeding in relation to altitude in Hawaii.

Sex Ratio.—Nearly all the ranges of pheasants in Hawaii showed a sex ratio of approximately 100 males to 100 females regardless of the density of the population. This sex ratio, which apparently persisted from hatching, occurred either where little hunting was done or where both males and females were taken during the hunting season, although males only were legal game.

Two exceptions to this normal ratio occurred—in the Waikii area and at Kahua Ranch, Hawaii—and here the sex ratio approximated 50 males to 100 females. This ratio is similar to the one (55 males to 100 females) reported for these areas by Hiatt (1945). In these two localities, a high breeding population occurred and hunting, although moderately high, was rigidly controlled so that only cocks were taken.

Survival of Young.—Young per observed brood varied from one to eight, averaging 3.0 in 49 broods. These low numbers occurred regardless of climatic conditions or islands with or without the mongoose. Compared to clutch size, this indicates a high mortality, apparently occurring between laying and when the broods are first seen commonly—about a week or so of age.

RANGE EVALUATION

Zone A.—Zone A is poor pheasant range. Pheasants occur here in non-arable sections, used either for pasture or waste, and in sugar cane lands. The non-arable lands constitute the driest occupied range and have densities of 10 or fewer birds per square mile. Water provided for cattle is accessible to pheasants in only a few places. While food plants are abundant following periods of rain, there are many months of drouth when pheasant forage is extremely meager. Likewise, the variety of plant species used as food is small, and competition through grazing of domestic cattle and feral stock reduces the restricted supply still more. Soils are generally poor and contribute to the inferior plant growth and sparse ground cover.

Sugar cane occurs on the better soil portions of this zone and higher populations (11 to 25 birds per square mile) are found here, probably because of the water provided for irrigation. This water, which is available over comparatively large areas throughout the year, likewise increases the growth of weedy plants along the margins of the fertilized cane fields. However, the beneficial effects of fertilization and irrigation are largely nullified as regards pheasant habitat because of the constant weed eradication practiced by the plantations and the extensiveness of sugar cane tracts with their uniform, dense growth which limits diversification of food and cover species.

The aridity of this zone, expressed in an absence of both rainfall and succulent forage, is the principal limiting factor since it affects not only the survival of young and adult birds but breeding as well. If our limited food study in this zone is indicative, pheasants seek moisture-providing foods, since the dietary here consists of 44 per cent fruits, 1 per cent browse, and 35 per cent animal matter (largely lepidopterous larvae or beetles) with only 20 per cent constituting seeds.

Zone B.—Zone B is considered one of the most productive vegetation zones for pheasants. Here, the bird lives in sugar cane, pineapple, and small truck-garden areas, and in pasture or waste lands. In sugar cane areas of this zone where densities of 25 or fewer birds per square mile occur, the same conditions prevail as in zone A. Higher densities are found where the irrigated cane fields are broken into small units by well-vegetated gulches and better developed pasture lands, creating an interspersion of food and cover species adjacent to available water.

The culture of pineapple plays an important rôle in maintaining pheasant populations in zone B. Approximately one-fifth of each plantation's acreage is allowed to fallow each year. Prior to being "knocked-down" and re-cultivated, these fallow fields promote an abundant weedy growth which with old pineapple plants produces a highly desirable food and cover system. Pineapples and the succulent fruits of interspersed weeds furnish a valuable source of moisture, but some water is also available from rainfall and dew. However, the capabilities of different plantations vary according to the extensiveness and degree to which the fields are dissected by broken land with its accompanying heavily wooded and weedy vegetation. Densities below 26 birds per square mile occur in those pineapple areas without this interspersion, while higher densities are found where the proportion of broken land is greater.

Densities of 51 to 100 birds per square mile on Kauai can be traced to the development of an irrigated area, scattered portions of which were withdrawn from sugar cane production. These were cultivated as vegetable gardens and experimental cattle forage plots during the late war and subsequently have been continued on a smaller scale. Accompanying and following the gardening, abundant herbaceous cover developed. The surrounding natural cover composed of dense thickets of *Lantana*, puakeawe, and bracken fern, *Pteridium aquilinum* var. *decompositum*, on the sides and bottoms of dissecting gullies, in combination with the abundant cultivated and weedy foods in this heavily fertilized and irrigated section, furnishes a desirable environment for pheasants.

Land in pasture or waste supports, for the most part, populations of 25 or fewer birds per square mile because of the aridity, extremely poor rocky soil, and often dense stands of cactus or *Lantana* which furnish their maximum food and cover value only along their peripheries. Domestic stock and, to a lesser extent, feral goats compete with pheasants for food throughout these non-arable lands, especially during drier portions of the year. Higher pheasant populations occur

along margins of pasture lands adjacent to zone C_2, where habitat conditions are considerably better.

Food studies in zone B show the following: 24 per cent fruits, 45 per cent browse, 20 per cent seeds, and 11 per cent animal matter. Here, in common with the semi-arid conditions of zone A, pheasants eat a majority of moisture-providing foods, but because of a somewhat higher rainfall there is a greater variety of food plants.

Zone C_1.—This zone is only moderately productive of pheasants. Perhaps the most favorable factor when compared with zones A and B is increased rainfall and its fairly uniform distribution throughout the year.

Pheasants are found in pasture areas, pineapple lands, or sugar plantations. Pastures consist mostly of submarginal land covered in many places with dense stands of *Lantana* or dissected by gullies and ravines often choked with guava. The best habitat for pheasants occurs along the margins of these heavily vegetated areas which usually possess a variety of food species. However, pheasants are present only in densities of 25 or fewer birds per square mile.

A large part of the pineapple land supports densities of 26 to 50 birds per square mile because of interspersed submarginal land which is usually grown up to good cover of both herbaceous and woody types. Here, cane lands and their productivity of pheasants are similar to zone B.

Zone C_2.—Zone C_2 has some of the best pheasant range in Hawaii. The elevations of this zone favor temperate plants, and the dry summers permit good seed production. Well distributed annual rainfall and plentiful dew, coupled with abundant browse and fruits, amply meet the pheasant's moisture requirements.

Highest densities in this zone (51 to 100 birds per square mile) occur in the vicinity of Waikii, Hawaii, and are the result of a distinctive combination of environmental factors. Because this area represents a pocket of fertile soil situated in a suitable climate, large acreages of corn are possible. For the past 10 years parts of this section, varying from 700 to 1,500 acres annually, have been cultivated in corn and cereal grains, with rotation from cultivation to sod occurring within two- to six-year periods. This system created a vegetative pattern of rich volunteer herbaceous food and cover in the fallow fields interspersed with cultivated areas. Large expanses of good grassland likewise contributed to a very desirable habitat.

Since 1944, the crop acreage has been reduced to less than 200 acres and thus the present range consists almost entirely of grassland with some weedy fallow fields remaining from the former more extensive

cultivation. All the factors contributing to the present populations are difficult to evaluate, but good soil coupled with secondary results of cultivation and primary crops has doubtless been influential.

Adjacent to this area and elsewhere in this zone, densities from 26 to 50 birds per square mile occur in good but heavily grazed pasture lands or in scattered truck-garden areas with poor adjacent cover.

Densities of less than 25 birds per square mile occur in the poorer soil and drier portions of zone C_2 where plant growth is inferior and dense stands of cactus, pamakani, or timber often occur. One exception to this general analysis occurs in the Kapapala region of Hawaii, where range conditions appear much better for pheasants than population figures indicate. A dwindling population is reported in this area and we suspect this may be associated with the decrease in cultivation of certain forage crops, principally pigeon pea, *Cajanus Cajan*, which was formerly grown here in scattered locations.

In this zone, seeds constitute 44 per cent of the food, browse 29 per cent, fruits 14 per cent, and animal matter 13 per cent. An examination of the important food species shows a direct relationship to the pasture system; with the exception of the endemic shrub akia which occurs on rocky outcrops, planted pasture species, and weedy growth responding to grazing form the bulk of the diet. Food species are plentiful throughout the year, but there are places where heavy grazing and poorer soils limit their abundance. Cultivated foods are important only locally.

Zone D_1.—Zone D_1 is another good pheasant zone. However, here the rainfall is very high, with a minimum of 60 inches annually, and toward the upper limits this greatly inhibits successful reproduction.

Densities above 26 birds per square mile occur in regions affiliated with pineapple cultivation, in non-irrigated, sugar cane lands with considerable interspersion of gullies and other broken land, and in good pasture having a combination of shrubby cover and abundant food.

Lower densities are found in grazed areas on poorer soils which are thought to show nutrient deficiencies. This grassland is interspersed with numerous, deep ravines choked with dense guava and staghorn fern which afford little attraction to pheasants.

The distribution of food types in the diet is as follows: 28 per cent seeds, 34 per cent fruits, 22 per cent browse, and 16 per cent animal matter.

Zone D_2.—Zone D_2 is very poor pheasant range because of the heavy annual rainfall (100 to 450 inches) which practically prohibits successful breeding and because of the prevailing dense forest cover. There

is little variety of pheasant food except in occasional small clearings, along trails, or margins of the forests.

Occupied portions occur where small areas of open land on the borders of this zone are continuous with ranges in adjacent zones.

Zone D_3.—This zone is considered of intermediate quality on the basis of population figures. Rainfall limits lie between 50 and 100 inches annually and this rainfall, together with adequate moisture-providing plants, more than fulfills the requirements for available water. Yet this same precipitation, which occurs commonly as mist, doubtless limits production of young by requiring their constant brooding by the hen. Chicks which become wet and chilled are unable to forage satisfactorily and hence perish.

Grazing is the major land use. Densities above 26 birds per square mile are found primarily in open forested sections which have resulted from past grazing. The present range consists principally of koa forest interspersed with open grassy meadows or deeper ravines where ferns predominate. Where grazing has been curtailed, more herbaceous species occur. Here the Green Pheasant thrives.

Uniform expanses of grass resulting from heavy grazing and heavier-forested sections without interspersion of food or cover necessary for pheasants support densities of less than 26 birds per square mile. Ring-necked and hybrid pheasants are more common than Green Pheasants in these latter cover types.

The diet in this zone consists of 60 per cent browse, 5 per cent animal matter, 25 per cent seeds, and 10 per cent fruits, indicating the relative availability of each food type.

Zone E_1.—Vegetation zone E_1 ranks among the better zones for pheasants, and here both Ring-necked and Green pheasants do well.

Grazing is the major use of the land though some small sections are capable of supporting corn. Densities above 51 birds per square mile occur near Waikii, Hawaii, for the same reasons discussed under zone C_2.

Densities of less than 26 birds per square mile occur on Hawaii where the range is broken by numerous recent lava flows. Food species are sparser and cover denser here than in the best parts of the range in this zone. Near Humuula, Hawaii, overgrazing by domestic sheep and the accompanying soil erosion create only poor range for pheasants.

Densities between 26 and 50 birds per square mile prevail on Maui where the grassland is very open with little interspersion except for scattered *Eucalyptus* groves. In places, pamakani occurs in stands so dense as to provide habitat only along the peripheries.

Food studies made primarily in grassland regions indicate that browse constitutes 61 per cent of the diet, fruits 4 per cent, seeds 18 per cent, and animal matter 17 per cent. The species eaten are common in these sections, and food and moisture are not limiting factors here. However, in other regions of this zone variations in seasonal rainfall and lowered moisture retention by the shallow soils affect availability of browse species which, combined with a lack of other available moisture sources, may limit pheasant populations.

Zone E_2.—The poor quality of zone E_2 may be attributed to the prevailing arid conditions and on Hawaii to vast expanses of barren lava or shallow soils with little vegetation. While almost none of this zone is used for domestic cattle, feral sheep graze it heavily and compete with pheasants for food.

Densities between 26 and 50 birds per square mile are found primarily on Maui where soil and moisture conditions are somewhat better and result in improved food and cover. The general scattered abundance of puakeawe provides good shrubby interspersion, but it tends to become too dense in spots. Heavy grazing by feral goats adversely influences cover in places.

Zone E_3.—No pheasants occur in this zone. Temperatures during the summer are too low to permit growth of seed-producing plants which pheasants require for food and cover and, during the winter, ice and snow accompany the below-freezing temperatures.

SUMMARY

1. The Ring-necked Pheasant was first brought to Hawaii about 1865, but subsequent liberations were made on all islands. The Green or Versicolor Pheasant was liberated on all islands prior to 1900 but other plantings also occurred. Hybrid pheasants result from matings between Ring-necked and Green pheasants. All other species of pheasants introduced into Hawaii failed to survive.

2. A description of the Hawaiian Islands includes a discussion of their location, origin, topography, size, elevation, climate, soils, land use, and vegetation.

3. In Hawaii, Ring-necked Pheasants range: (1) from sea level to 11,000 feet elevation; (2) from subtropical regions to those where freezing temperatures occur frequently; (3) where less than 10 inches of rain falls annually to places receiving 300 inches; (4) on recent soils (lava) to those soils with deep pockets of loam; (5) in forested and grassland regions, deserts, and other waste areas; (6) in pineapple fields, sugar cane lands, small truck-gardens and corn acreages; and (7) in all types of topographic conditions. Best populations are

found on soils of better fertility where the land use permits, in areas receiving between approximately 20 and 80 inches of rainfall annually, and in generally open cover interspersed with abundant forage species, and with some form of available moisture.

4. The best range for Green Pheasants occurs between approximately 4,000 and 7,000 feet elevation in vegetation zones D_3 and E_1 on the island of Hawaii. This area is primarily open *Acacia Koa* forest with interspersed grassy meadows containing mixed herbaceous growth. The mean annual temperature is about 50° F., and maximum rainfall is 125 inches at lower elevations and 20 inches at higher altitudes. Soils are better than in other occupied areas and the surface is gently sloping.

5. The Green Pheasant is decreasing in Hawaii through hybridization, and its restricted distribution and fewer numbers favor the Ring-necked Pheasant.

6. A population of 70,000 pheasants was estimated in 1946–1947 for 3,700 square miles of range on all the major Hawaiian Islands. Population densities varied from less than 10 to 100 birds per square mile. The most productive vegetation zones for pheasants are B, C_2, D_1, and E_1. Zones C_1 and D_3 are moderately productive, and the poorest are A, D_2, and E_2. No pheasants occur in zone E_3.

7. An analysis of foods of 191 pheasants showed 97 plant and 55 animal foods. The relative amounts of fruit, browse, seeds, and animal matter corresponded to availability in the various zones. The wide variety of foods that pheasants eat illustrates the adaptability of this bird to the different habitat conditions in Hawaii. Foods of chicks are the same as for adults, but chicks tend to take more animal matter. Grit was found in 80.2 per cent of the gizzards and in 2.6 per cent of the crops. Feeding is casual during the morning but increases after mid-day, and most birds go to roost with full crops. The feeding range covers about a one-fourth mile radius.

8. Where surface water is unavailable, pheasants subsist on occasional dew or mist, infrequent rains, succulent vegetation, fleshy fruits, and soft-bodied insects. There are many areas in Hawaii where the pheasant population is limited because of lack of water or moisture-providing foods.

9. Pheasants roost both on the ground and in trees, but trees are preferred.

10. External arthropod parasites consist of three species of mites, seven species of lice, and one species of hippoboscid fly. Helminth parasites include the eye worm, one species of ascarid worm, and two species each of cecal worms and gizzard worms. The occurrence of

the respective parasites in pheasants is related to the intermediate hosts taken as food.

11. The mongoose is probably the most important predator, while rats, feral cats, feral pigs, and fire ants are possible predators.

12. Pheasant cocks are taken out-of-season for their plumage, and hens suffer from illegal kill during the open season on cocks.

13. General crowing of the males begins in late January or early February. Laying starts early in March, and incubation takes place mostly during April and May. Hatching occurs from early May through June. There may be a revival of crowing in the fall but no breeding ensues.

14. The sex ratio in nearly all the ranges of pheasants in Hawaii is approximately 100 males to 100 females. Exceptions occurred in two areas where due to managed hunting the sex ratio approximated 50 males to 100 females.

15. From 6 to 11 eggs occurred in 55 nests, but the average of young in 49 broods was 3.0.

16. Each vegetation zone with its land uses is evaluated as pheasant range.

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THE TURKEY VULTURE IN NEW ENGLAND AND EASTERN CANADA UP TO 1950

BY AARON M. BAGG AND HENRY M. PARKER

FORBUSH (1927: 89) described the Eastern Turkey Vulture, *Cathartes aura septentrionalis*, as "occasional" in all the New England states except Vermont, where he called it "accidental."

During the past quarter-century, however, *C. a. septentrionalis* has been among a group of "southern" species moving northward in eastern North America. Griscom (1949: 133) remarked of this bird: "Breeding range extended from northern New Jersey to the southwestern corner of Massachusetts." In 1947 it was found nesting in Stony Creek, New Haven County, Connecticut.

This penetration of New England by the Turkey Vulture as a breeding bird has been part of a general northward advance. While this study is confined to New England and eastern Canada, there is relevant evidence from areas lying to the west. For this evidence, we are grateful to Dr. A. A. Allen, James L. Baillie, and Dr. J. Van Tyne. Regarding northern New York, Dr. Allen wrote (1950: *in litt.*): "So far as I know, no one has yet found the actual nesting grounds in Central or Northwestern New York State; but there has been an ever-increasing number of summer records of the birds during the past twenty years, particularly around Bergen Swamp, southwest of Rochester and around Howland's Island, and Montezuma Refuge at the north end of Cayuga Lake."

Describing the bird's status in southern Ontario, Mr. Baillie wrote (1950: *in litt.*): "The Turkey Vulture has been gradually extending its range northward in Ontario during the past few decades. Up to 1928, this bird, here at the northern edge of its range, was known to nest only in the Kenora (Lake of the Woods) region and in the southwestern counties of Essex, Kent, Lambton and Middlesex. In 1928, they were first found nesting in southern Bruce; in 1932, in Grey County; in 1938, Norfolk County; in 1943, the Bruce Peninsula and near Georgetown in Halton County; about 1945, in Elgin County; and in 1946, near Forks of the Credit, in Peel County. There is evidence to suggest that they now nest in Manitoulin Island, in Simcoe County, and in the Niagara Peninsula, but actual breeding data from those areas have not been reported as yet."

In regard to the Turkey Vulture's status in Michigan, Dr. Van Tyne reported (1950: *in litt.*): "I personally have seen the species increase from a rare one (1920–25) to a common one in the Ann Arbor

region (1949). In the last 10 years I have seen the Turkey Vulture change from very rare to fairly common in the Crawford-Oscoda county region, 200 miles north of Ann Arbor."

In connection with the recent range-extension of *C. a. septentrionalis* in eastern North America, it appears that the western race had previously decreased in Montana, Minnesota, and southwestern Saskatchewan. This has been mentioned by Cameron (1907: 259), Saunders (1911: 35), Roberts (1932: 295), and Potter (1930: 148).

The northeastern manifestation of the Turkey Vulture's range-extension, up to the southwestern boundaries of New England, ran chronologically somewhat as follows:

Stone (1908: 156) described the species as ranging north in New Jersey, in summer, more or less regularly to Sandy Hook, Plainfield, Lebanon, and Princeton. Griscom (1923: 179), reporting a change in its New Jersey distribution since Stone's 1908 statement, described the species as "a common summer resident in western and northwestern New Jersey right up to the New York State line, especially along the Kittatinny Ridge. . . . [where] it undoubtedly breeds."

On June 8, 1925, the first reported nest of a Turkey Vulture in New York State was found at Lewisboro, Westchester County (Howes, 1926). The second nest was found on May 28, 1927, in Tonawanda Swamp, near West Barre, Orleans County (Smith, 1927: 151).

Sutton (1928: 501–503) reported that this species had "extended its range northward noticeably in the central mountain district" of Pennsylvania in 1928. Observing that deer had become so abundant in certain parts of that state as to suffer heavy mortality from undernourishment or disease, Sutton suggested that the Turkey Vulture had extended its breeding range into those areas "chiefly as a result, it would seem, of the presence of a dependable food supply."

In commenting on the common spring occurrence, and probable breeding, of Turkey Vultures near Lake Mohonk, Ulster County, N. Y., Smiley and Smiley (1931: 121) remarked: "This is one of the many instances of the northward extension of range of the Turkey Vulture since the [1910] publication of Eaton's 'Birds of New York'."

Pangburn (1929: 385–386) suggested that this bird might be "extending its range east of the Hudson [River]." Ogburn (1938: 521–522) reported "the phenomenal increase of Turkey Vultures in . . . [Westchester] county during the last decade," particularly during May and September, observing that "the object of this spectacular annual migration is a provoking mystery."

Griscom (1933: 90) said: "The Turkey Vulture is a regular summer resident in the high hills of Putnam County [N. Y.] and occurs annually

around Mt. Beacon, so it might be found nesting in Dutchess County [N. Y.]. It wanders northward with some regularity into the south central portions of [Dutchess County] . . . further north it decreases rapidly and becomes merely a straggler." E. T. Townsend, Senior

FIGURE 1.—Records of Turkey Vultures in Northeastern United States.

Game Warden of Westchester County, reported (1949: *in litt.*) that, probably in 1946, "a reliable observer noted 63 Turkey Vultures in one day during a drive in Dutchess County."

More recently Cruickshank (1942: 127) has summarized this bird's status in the southwestern approaches to New England: "The picture in New Jersey remains virtually the same today [as in Griscom's 1923 statement] but now the bird has extended its range even beyond the Kittatinny Ridge, up into the lower Catskills and across northern

Rockland County and through Putnam and Dutchess Counties to western Connecticut and extreme northern Westchester County. Each year it becomes more common throughout this extension of its range, and it now undoubtedly breeds regularly in the highlands of Rockland, Putnam and Westchester Counties."

We have no explanation for this northward extension of the Turkey Vulture's range during the second quarter of this century. But, as far as the northeastern states are concerned, several factors, acting in combination, may be responsible. The following might be mentioned:

1. The fact that the climate in the Northeast has grown warmer during the past several decades.

2. The great increase in the deer population in the Northeast, particularly since 1920. This correlation has been suggested by Sutton (*loc. cit.*) and Peterson (1948: 73). Van Tyne (1950: *in litt.*), however, points out that this factor can not be the "single explanation" for the bird's increase in Michigan.

3. The fact that the increased regularity of this species in southern New England has coincided with the increased mortality of animal life on the highways suggests the possibility that Turkey Vultures have availed themselves of this potential food supply in the Northeast, as they are reported to have done elsewhere by Jones (1935: 444–445), Lewis (1936: 76), Spiker (1936: 76–77), and Rapp (1943: 95). In fact, Sprunt (1937: 383–384) remarked: "Throughout much of the South, the feeding of vultures in highways has greatly increased, due to the numbers of small mammals, birds and reptiles which are killed by passing cars. Indeed, this has been advanced by some observers as a reason for the Black Vulture (*Coragyps atratus atratus*) extending its range northward in recent years." We have found no reports of the phenomenon in New England, however, and we must consider this factor merely an incidental one in the area under discussion.

4. The possibility that we have here a vigorous species which is not unduly persecuted but which, nevertheless, is forced by the spread of civilization to occupy more of its potentially usable breeding range. Miller (1942: 213) called the Turkey Vulture "a species of great vigor and versatility."

5. Trotter (1909: 230–231) considered "the Carolinian birds [to be] the laggards . . . in a general tendency of various species of birds to spread gradually northward into a region of new environing conditions which has been opened to them since the Glacial Period." He then continued: "Some of the Carolinian species, as the Cardinal, the Carolina Wren, the Tufted Titmouse, and the Turkey Buzzard show but a slight tendency to recede from their breeding range during the

winter, owing, no doubt, to the less northerly position which they have attained." The prophecy implied in this statement becomes interesting when we consider the Turkey Vulture's range-extension since 1909.

Whatever the reason may be for this range-extension, a result has been that this bird has occurred far more frequently during the past 20 years in certain parts of southern New England than it did in Forbush's time. Consequently, it seems fitting to review the history of *C. a. septentrionalis*, up to 1950, in New England and those sections of eastern Canada lying north and northeast of New England.

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Here we would digress to remark that since 1930 the Turkey Vulture has occurred so regularly in certain parts of western Connecticut and extreme southwestern Massachusetts that the available published records do not indicate accurately its true status in those areas. Accordingly, the authors arbitrarily have set off this section of New England by means of a line passing through Great Barrington, Mass., and New Haven, Conn. Neither the tables nor the map will present records for the area lying west of this line. Rather, the status of the bird in that region will be summarized in the text.

CONNECTICUT

As late as 1927, in reporting a bird shot at East River (New Haven County) on May 25 of that year, Townshend (1927: 419) remarked: "The occurrence of the Turkey Vulture in Connecticut is of sufficient rarety [*sic*] to make it worth while recording . . ." According to Townshend's text, the 1927 bird constituted the 19th record for Con-

necticut, the first of these having been obtained at New Haven in 1853. For details of early Connecticut records, see Sage, Bishop and Bliss (1913: 73–74).

Porter (1922: 275), reporting a Turkey Vulture seen in Stamford, Fairfield County, April 24, 1921, said: "This is the first one of these birds I have ever seen in Connecticut, and the number reported for Connecticut is so few that it seems worth while to add this to the list."

Mathers (1931: 257–259), however, recorded the finding, on July 28, 1930, of two young Turkey Vultures ("their bodies still covered with white down") on a hillside ledge at Lake Candlewood, Conn., some 20–25 miles north of the 1925 Lewisboro, N. Y., breeding location. The presumed nesting-site was on the east side of Lake Candlewood; according to Kuerzi and Kuerzi (1934: 6) it was in Fairfield County.

Describing this bird's recent status in one part of Fairfield County, Heck (1948: *in litt.*) said: "During the 10 years that I have summered in Wilton, the Turkey Vulture has definitely increased in numbers. I had always seen them quite regularly during the migration months, but for the past 2 or 3 years they have become more and more common during the summer months, often in pairs. I know of no nesting sites in Wilton or in other parts of Fairfield County."

Bradley (1949: *in litt.*) also wrote of the region around Wilton: "There are rumors of vultures nesting in Redding. Some years ago, Mr. Novack, of the Fairfield Bird Sanctuary, was presented with a young bird, from that general area."

Writing from Fairfield, Saunders (1947: *in litt.*) observed: "Actually, I haven't noted any increase in the Turkey Vulture here . . . I believe [that the bird] likes hilly country some miles back from the coast, and I don't get to such places often." However, Mrs. Long (1950: *in litt.*) reported that in the summers of 1948 and 1949 these birds appeared quite regularly in the vicinity of Westport, Fairfield County, and "two have been around all winter [1949–1950] at the Easton town dump, where Mr. Novack saw 13 in December, 1947."

In 1934, Kuerzi and Kuerzi (1934: 6) called the species an "occasional visitant" in western Litchfield County. By 1940 it had become a regular, though not common, visitor in the vicinity of Sharon, West Cornwall, and Lime Rock (Bagg: personal observations). More recently, Hunt (1948: *in litt.*) has written of the region around Washington, Litchfield County: "For the past 4 or 5 years I have seen them in summer around my place in small groups of 3 to 6 at a time. A neighbor says he has seen as many as 9 at once near Sheep Rock, and they are there throughout the nesting season each year."

In reporting a Turkey Vulture seen in West Haven, New Haven County, on May 7, 1913, Bishop (1921: 585) remarked: "This is the only Turkey Vulture I have seen in Connecticut." Ball (1948: *in litt.*) has written as follows concerning the New Haven region: "Curiously enough most of our records of turkey vultures have come from east of New Haven—many of them from near the Connecticut River between Saybrook and Middletown and from the shore towns, especially Guilford. The trap rock ridge extending north from West Rock, New Haven, seems to be a favorite avenue [of spring migration]. I have seen from 4 to 8 [there] on several occasions during March and April since 1942 . . . I have no certain nesting records, but feel sure the species does so in Connecticut."

Bergstrom (1949: *in litt.*) quoted a personal communication from Dr. Locke MacKenzie concerning this bird in the Guilford region as follows: "We have seen the bird during every month of the year, first on March 26, 1940. It became, in our area, increasingly common until 1946 and 1947, since when it has seemed to decrease in regularity and abundance. It was not unusual to see 6 to 8 in the air at one time in North Guilford during the summers of 1946 and 1947. On July 19, 1947, a nest with 2 young was found in a buttonwood tree in Stony Creek by William Seifert. He showed us the tree and the nest later on. That same summer he told me that several pairs were nesting in a hemlock grove well back in the woods at North Guilford, although I was never able to visit the area."

Merriam (1877: 91–92) cited reports by Linsley (1843) and Purdie (1873) concerning reputed early occurrences of the Turkey Vulture in areas of south-central Connecticut where the species recently has appeared with regularity. We do not consider these early reports sufficiently valid, however, to warrant our developing any hypotheses which they may suggest.

Stoddard (1948: *in litt.*) wrote that the Turkey Vulture is now a regular summer visitant in the area about the mouth of the Connecticut River. "Prior to 1941, when I first saw one on the southern border of East Haddam-Salem (May 25), I had no record of the species in southeast Connecticut. This summer (1948) seven were reported from Killingworth feeding from a dead calf. 'More than a dozen during day' reported several times."

Table 1 has been assembled from records found in Merriam (1877), Brockway (1898), Sage, Bishop and Bliss (1913), Saunders (1918), Townshend (1927), Bagg and Eliot (1937), the Massachusetts Audubon Society's 'Bulletin of New England Bird Life' and 'Records of New England Birds,' and personal records of Dr. Stanley C. Ball and

Douglas L. Kraus. As Palmer (1949: 17) has remarked, data such as those obtained from 'Records of New England Birds' fall under the category of processed literature. Nevertheless, we feel that such material is sufficiently accurate to warrant its use. It should be

TABLE 1

SUMMARY OF RECORDS OF THE TURKEY VULTURE IN CONNECTICUT

	January	*February*	*March*	*April*	*May*	*June*	*July*	*August*	*September*	*October*	*November*	*December*	*Month?*	TOTALS
1860–69	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1870–79	—	—	—	—	—	—	—	—	1	9	—	—	1	11
1880–89	—	—	1	1	—	—	—	—	—	—	—	—	—	2
1890–99	—	—	—	—	—	—	—	1	—	—	—	—	—	1
1900–09	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1910–19	—	—	—	—	1	—	—	—	—	—	—	—	—	1
1920–29	—	—	—	1	1	—	—	—	—	—	—	—	—	2
1930–39	1	1	—	1	—	—	—	—	2	1	1	—	—	7
1940	—	—	2	—	—	—	—	—	—	—	—	—	—	2
1941	—	—	—	1	—	—	—	—	—	—	—	—	—	1
1942	—	—	—	2	2	—	—	—	3	1	1	—	—	9
1943	—	—	—	5	6	1	—	—	—	—	—	—	—	12
1944	—	—	—	8	—	—	—	—	—	—	—	—	—	8
1945	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1946	—	—	3	1	9	—	—	—	—	11	21	—	—	45
1947	—	—	—	22	18	1	—	—	—	—	—	—	—	41
1948	—	—	—	—	23	—	—	—	—	—	—	—	—	23
1949	—	—	—	7	2	—	—	—	3	3	—	—	—	15
TOTALS	1	1	6	49	62	2	—	1	9	25	23	—	1	180

emphasized again that the records represented in this table are *exclusively* from that part of the state lying east of the arbitrary line passing through Great Barrington, Mass., and New Haven, Conn.

Summary for Connecticut

1. During the past 20 years the Turkey Vulture has become a regular, but not common, migrant and summer resident in certain parts of western and southern Connecticut. In 1949–1950 the species wintered in Fairfield County.

2. There is only one definite breeding record for the state—New Haven County, 1947. It is probable, however, that the bird has nested in Fairfield, and possibly in Litchfield and Middlesex counties.

3. There are Connecticut records for every month in the year.

4. Through 1949 there were no records for the two northeastern counties, Tolland and Windham. A possible factor here may have been the lack of observers in that area. On July 1, 1950, Wendell Taber and Allen Morgan saw a Turkey Vulture in North Woodstock, Windham County (Taber, 1950: *in litt.*). To the best of our knowl-

edge, this was the first record from the triangular area formed by lines connecting Hartford, Conn., Worcester, Mass., and Providence, R. I.

5. Records for New London County should be considered in connection with those for adjacent Washington County, R. I.

RHODE ISLAND

The following table, which contains *all* records which we have found for the state, has been compiled from material appearing in Howe and Sturtevant (1899), Hathaway (1913), Forbush (1927), Birckhead

TABLE 2

SUMMARY OF RECORDS OF THE TURKEY VULTURE IN RHODE ISLAND

	January	*February*	*March*	*April*	*May*	*June*	*July*	*August*	*September*	*October*	*November*	*December*	*Month?*	TOTALS
1860–69	—	—	—	—	—	—	—	—	—	—	—	—	1	1
1870–79	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1880–89	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1890–99	—	—	—	—	1	1	—	—	—	—	1	—	—	3
1900–09	—	—	—	—	—	1	—	—	—	—	—	—	—	1
1910–19	—	—	—	1	—	—	—	—	—	—	—	—	—	1
1920–29	—	—	1	—	—	—	—	—	—	—	—	—	—	1
1930–39	—	—	—	—	1	—	1	—	1	—	—	—	—	3
1940	—	—	—	—	—	—	1	1	—	—	—	—	—	2
1941	—	—	—	—	1	—	—	—	1	—	—	—	—	2
1942	—	—	—	—	1	—	—	—	—	—	1	—	—	2
1943	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1944	—	—	—	—	—	—	—	—	—	1	—	—	—	1
1945	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1946	—	—	1	3	—	—	—	—	—	—	—	—	—	4
1947	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1948	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1949	—	—	—	17	7	—	—	—	1	—	—	—	—	25
TOTALS	—	—	2	21	11	2	2	1	3	1	2	—	1	46

(1941), 'Bulletin of New England Bird Life,' 'Records of New England Birds,' and the personal records of Roland Clement and Douglas Kraus, both of whom have been extremely active in the field over a period of years, keeping detailed records of Rhode Island birds.

Summary for Rhode Island

1. Of the 46 individuals represented in the table, 39 (85 per cent) were reported during the period of 1930–1949.

2. *All records* are from the two southern, coastal counties, Washington and Newport. There are three records for Block Island. The recordless northern part of the state is adjacent to similarly blank areas in Connecticut and Massachusetts.

3. The bird remains an occasional visitant in Rhode Island.

MASSACHUSETTS

Faxon and Hoffmann (1900: 138) had only one record for the Turkey Vulture in Berkshire County—one shot in Williamstown, January 9, 1891. Describing the bird's recent status in this westernmost county of Massachusetts, Hendricks (1948: *in litt.*) remarked: "The first regular reports of the Turkey Vulture in the Mt. Everett region [extreme southwestern Massachusetts] began to appear in 1938, and since then they have been seen yearly, with as many as seven observed at one time. I would call the Turkey Vulture a regular summer visitor in the Mt. Everett region, and rare and irregular in other parts of Berkshire County. There are plenty of records from April to mid-July, but not so many after that, and *no* late autumn observations. This may be largely due, however, to lack of field trips in the southwestern corner of the state during that period. So far, we have no positive record of the species breeding here." However, we believe that the bird has nested in the vicinity of Mt. Everett. Griscom (1949: 133) evidently shared this belief.

In writing of a Turkey Vulture seen near Ludlow, Mass., on September 17, 1932, Eliot (1933: 212–213) remarked: "It seems, this is the second record for the Connecticut Valley in Massachusetts—the first being a specimen . . . that was shot at Becket (40 miles farther west) on June 8, 1905." Beginning in 1937, however, at least one Turkey Vulture per year has been reported as seen at, or within ten miles of, Mt. Tom, in the Connecticut Valley. The great majority of these reports which extend from March through November—with the exception of July—involve single birds; on a few occasions two birds have been seen, and on April 24, 1949, three were observed at Mt. Tom. Over half of the reports concern birds seen *at* Mt. Tom *in April*, when observers gather there to watch hawk-flights. These latter migrations, indeed, may draw the vultures to the Mt. Tom area. Only occasionally, however, has the bird appeared near Mt. Tom during the fall hawk-flights; Bagg and Eliot (1937: 112) included the reports of seven Turkey Vultures seen by reliable observers on September 18 and 28, 1933, in Amherst and over the Mt. Holyoke Range. In the vicinity of Mt. Tom the earliest record is for a bird seen in Westhampton on March 15, 1947; the latest is one observed in Amherst, November 11, 1949.

Bagg and Eliot (1937: 112) reported a Turkey Vulture seen in Hardwick, June 18, 1933. According to 'Bulletin of New England Bird Life,' an immature was shot in the same township, September 14, 1944. Another bird was seen there July 17, 1946. Then, in 1948,

according to records kept by Leslie Campbell, of Ware, the species began to appear more frequently in Hardwick and other nearby sections of what had become the great Quabbin Reservoir area. In 1949, Mr. Campbell listed the species on ten different occasions between April 26 and September 13, with a high count of five on May 4. Inconclusive as these records are, their recent increase suggests that Turkey Vultures may have nested in the Quabbin Reservoir region or used it as a summering ground for non-breeding birds.

In eastern Massachusetts, particularly along the coast, Turkey Vultures have appeared occasionally for years, but with greater regularity recently. Outside of southern Berkshire County, the Mt. Tom region, and the Quabbin Reservoir area, the bird remains occasional, but on the increase.

The following table has been compiled from material found in these references: Mason (1889), Brewster (1890 and 1906a), Miller (1892), White (1894), Mackay (1899), Faxon and Hoffmann (1900), Howe and Allen (1901), Morris (1905), Townsend (1905), Allen (1914), Noble (1914), Farley (1919), Eldredge (1930), Eliot (1933 and 1941), Bagg and Eliot (1937), 'Mass. Aud. Soc. Bulletin' (1941 and 1944), Griscom and Folger (1948), Griscom (1949), 'Bulletin of New England Bird Life,' 'Records of New England Birds,' and the personal records of Leslie Campbell and David Wetherbee. It should be emphasized that *no* records are included from the Mt. Everett region, in the extreme southwestern corner of the state, where (as explained above) the available records do not adequately portray the bird's true status.

Summary for Massachusetts

1. Since 1930 the Turkey Vulture has become, on a very small scale, a regular summer resident in southern Berkshire County, a regular spring migrant near Mt. Tom, and (in recent years) a possible summer resident in the vicinity of Quabbin Reservoir.

2. Omitting records for the three localities just mentioned, the species was reported in the rest of the state about six times per year during the period of 1940–1949.

3. While the bird has been reported in every month except December, there is a heavy preponderance of spring records, April and May together accounting for 51 per cent. According to Forbush (1927: 89), "one bird remained on Marthas Vineyard most of one winter."

4. The bird has occurred in every county in the state. There are, however, apparently no records for southern Worcester County or for northern Bristol. These regions are adjacent to similarly blank areas

TABLE 3

SUMMARY OF RECORDS OF THE TURKEY VULTURE IN MASSACHUSETTS

	January	*February*	*March*	*April*	*May*	*June*	*July*	*August*	*September*	*October*	*November*	*December*	TOTALS
1860–69	—	—	—	—	—	—	—	1	—	—	—	—	1
1870–79	—	—	—	—	—	—	—	—	—	—	—	—	—
1880–89	—	—	—	—	1	—	—	—	2	—	1	—	4
1890–99	1	—	—	1	—	1	—	—	3	—	—	—	6
1900–09	—	—	—	—	—	1	—	—	1	—	—	—	2
1910–19	—	—	—	—	—	—	3	—	—	—	—	—	3
1920–29	—	—	—	—	—	—	—	—	—	—	1	—	1
1930–39	—	—	—	15	1	3	1	—	9	—	—	—	29
1940	—	1	—	5	3	1	—	3	—	—	—	—	13
1941	—	—	1	1	4	1	—	—	—	1	—	—	8
1942	—	—	1	6	4	—	—	1	2	2	1	—	17
1943	—	—	1	—	3	3	1	—	1	1	—	—	10
1944	—	—	—	5	2	—	6	—	4	—	—	—	17
1945	—	—	1	4	—	7	—	2	—	4	—	—	18
1946	—	—	4	3	—	2	1	—	1	—	—	—	11
1947	—	—	1	2	5	—	—	—	—	—	—	—	8
1948	—	—	—	8	2	1	1	2	4	—	—	—	18
1949	—	—	1	18	16	1	1	2	2	1	3	—	45
TOTALS	1	1	10	68	41	21	14	11	29	9	6	—	211

in northeastern Connecticut and northern Rhode Island. Here again, absence of records may reflect lack of coverage.

VERMONT

According to Wendell Smith (1947: *in litt.*), Cutting (1884) said of the Turkey Vulture in Vermont: "Not often seen, but I have known of one capture." No further details are given by Cutting, and one might consider the reference as having a possible relation to the report, given by Forbush (1927: 89), of a bird taken prior to 1875 in "Eutaw." On the basis of a report in 'Forest and Stream' (vol. 4: 5, 1875) Stearns (1894: 137) gave this "record" as follows: "One was shot where Eutaw, Greene County, Vt., now stands." According to H. H. Chadwick, however, there is nothing like "Eutaw" in a fairly complete list of place-names compiled by the Vermont Development Commission. Moreover, Vermont has no "Greene County." But there is a "Eutaw" in "Greene County," Alabama. Accordingly, there seems to be no definite record for this species in Vermont prior to the following items: June 22, 1926, Woodstock, 1 taken (Forbush, 1927: 89); April 24, 1938, Gaysville Mt., 1 seen ('Bull. New Eng. Bird Life'); *ca.* Sept. 1, 1939, near Springfield, 1 seen (*fide* Smith); Aug. 19, 1940, Jacksonville, 1 seen (Eliot, 1941: 403).

Summary for Vermont

1. While there is less field-work done in Vermont than in many other parts of New England, the above probably represents a fairly accurate picture of the species' status in the state.

2. Accordingly, there would appear to be no reason for changing Forbush's estimate that the Turkey Vulture is accidental in Vermont.

NEW HAMPSHIRE

The Turkey Vulture records for the state are as follows: April 6 or 7, 1882, Hampton Falls, 1 taken (Cory, 1882: 184); spring, 1887, North Weare, 1 taken (Forbush, 1927: 89); May 15, 1898, Hampton Falls, 1 seen (Forbush, 1927: 89); April 30, 1928, Jaffrey, 1 taken (Shelley, 1928: 503); Aug. 10, 1940, Squam Lake, 1 seen (Eliot, 1941: 403); April 9, 1941, Harrisville, 1 seen ('Bull. New Eng. Bird Life'); April 13, 1947, New Hampton, 1 taken ('Rec. New Eng. Birds'); Oct. 12, 1948, New Hampton, 2 seen ('Rec. New Eng. Birds').

Summary for New Hampshire

1. Of the eight records, six are for spring months; half of them were obtained during the 1940s.

2. The status of this bird remains as occasional in New Hampshire.

3. While the data for Vermont and New Hampshire are extremely limited, they are consistent with the over-all impression that Turkey Vultures tend to avoid the Catskill-Adirondack-Green-White mountains system.

MAINE

Norton (1911: 263–264) revised the Turkey Vulture records for Maine, as he believed they should stand, up to that time. Recently, Palmer (1949: 132) brought the list up to date. The records accepted by him are as follows—see Palmer (*loc. cit.*) for references: prior to 1862, Calais region, 1 taken; *ca.* Nov. 1, 1874, Standish, 1 taken, 2 seen; *ca.* Dec. 31, 1876, Buxton, 1 taken; March 15, 1883, Denmark, 1 taken; prior to April, 1897, near Bangor, 1 seen; dates unknown, localities unknown, 2 caught in bear traps; Aug. 5, 1904, Scarborough, 1 seen; Aug. 27, 1910, Cape Elizabeth, 1 taken; *ca.* Aug. 1, 1916, near Bingham, 1 taken; *ca.* 1931, Bar Harbor, 1 seen (disabled?); July 3, 1940, Jackman, 1 captured alive; Aug., 1940, near Bangor, 2 seen; April 14, 1944, Gorham, 1 seen.

Since Palmer's list was published, the following reports have been published by Cruickshank (1950: 8), all possibly referring to the same bird: June 26, 1949, Pemaquid Pond, 1 seen; early July, 1949, near Bath, 1 seen; early July, 1949, near Friendship, 1 seen.

Summary for Maine

1. While Maine records exceed the combined total for Vermont and New Hampshire, the bird's status in Maine is, as Palmer observed, "rare *visitant*, March 15 to late December, chiefly in coastal counties."

2. The July and August records suggest summer wandering—*cf.* Cruickshank (1942: 127).

3. There is a slight increase in the number of records during the 1940s.

EASTERN CANADA

The following records obviously represent extreme marginal-fringe wanderings. They are included, however, not only to show the extent to which Turkey Vultures have drifted northward beyond New England, but also because such records are gathered together here probably for the first time.

QUEBEC PROVINCE

Johnson (1945: 46) discussed some of the following records for the province. The remainder have been provided through the kindness of Raymond Cayouette, Ian MacLaren, Rev. Rene Tanguay, and L. McI. Terrill. Labrador records appear under a separate heading below. Counties are given in parentheses: Aug. 27, 1893, Pointe des Monts (Saguenay), 1 caught in bear trap (Comeau, 1909: 434); July 31, 1917, Hatley (Stanstead), 1 seen (Mousley, 1918: 84); 1938 or before, Nicolet (Nicolet), 1 seen (*fide* Tanguay, 'Ann. Rept. Provancher Soc. Nat. Hist.,' 1938); June 4, 1938, St. Michel des Saints (Berthier), 1 found dead (*in* 'Rept. Prov. Quebec Soc. Prot. Birds,' 1938–1939: 9); *ca.* Aug., 1942, near Wright (Gatineau), 1 taken (Johnson, 1945: 46); April 2, 1949, Barrington (Huntingdon), 1 seen (MacLaren, *in litt.*).

Summary for Quebec

1. As Cayouette observed (*in litt.*), the Turkey Vulture is "a rare sight and purely accidental" in Quebec.

2. It will be noted that the Wright specimen, taken some 50 miles north of Ottawa, almost surely entered Quebec by way of Ontario. The question arises as to how many of the other birds reached Quebec via the Great Lakes and the St. Lawrence Valley.

3. As in Maine, the July and August records suggest summer wandering.

NEW BRUNSWICK

The authors are indebted to W. A. Squires, of the New Brunswick Museum, St. John, for furnishing them with the following 12 records of Turkey Vultures for the province: April, 1875, Grand Manan, 3

seen, of which 1 shot (Stearns, 1894: 137); 1879, Grand Manan, 1 taken (S. L. Boardman, 1903); *ca.* 1882, Kingston, now Rexton (Kent), 1 taken (Cox, 1887: 210); Jan. 29, 1884, Neguac (Northumberland), 1 taken (Cox, 1887: 208); Sept., 1886, Black Brook, now Loggieville (Northumberland), 1 found in net (Cox, 1887: 209); March, 1898, Victoria County, 1 taken (Moore, 1900: 177); spring, 1898, Keswick (York), 1 seen (Moore, 1900: 177) *ante* 1900, Grand Manan, 1 taken (Pettingill, 1939: 329); fall, 1900, Inner Wood Island, Grand Manan, 1 taken (Pettingill, 1939: 329); May 3, 1924, Scotch Lake (York), 4 seen (Peters, 1941: 129); June 16, 1940, Allandale (York), 1 taken (Peters, 1941: 129); July 24, 1946, Hampton (Kings), 1 seen (Squires, *in litt.*).

Summary for New Brunswick

1. Of the 12 records, 9 involve birds captured.

2. Rather interestingly, there are two spring sight records involving more than single birds: April, 1875, and May 3, 1924.

3. The bird's status in this province is rare visitant, mainly coastally or along the St. John River.

NOVA SCOTIA

The following nine records for the province are provided through the generosity of Robie W. Tufts, who took them from his permanent records. Previously, Douglas S. Miller had found some of them for the authors in the files of the 'Canadian Field-Naturalist': fall, 1892, Clark's Harbor, Cape Sable Island, 1 taken (Tufts, 1927: 65); 1896, Seal Island (Yarmouth), 1 taken (*fide* Tufts); *ca.* 1899, Middleboro (Cumberland), 1 taken (Tufts, 1927: 65); Nov. 10, 1909, Kemptville (Yarmouth), 1 taken (*fide* Tufts); Nov. 8, 1913, near Sydney (Cape Breton), 1 imm. taken (Tufts, 1927: 65); Nov. 25, 1919, Westchester (Cumberland), 1 trapped (*fide* Tufts); Jan. 1, 1926, Upper Canard (Kings), 1 imm. taken [According to Tufts, a second bird, seen at the time, was not shot] (Tufts, 1927: 65); Feb. 2, 1946, Cook's Cove (Guysboro), 1 taken (*fide* Tufts); Oct. 12, 1946, Bucklaw (Inverness), 1 seen (Goodwill, 1948: 41).

Summary for Nova Scotia

1. Of the nine records, all but one involve birds taken.

2. The emphasis upon fall and winter is apparent. This fact suggests the possibility that these birds drifted into Nova Scotia from New Brunswick in early fall, and subsequently failed to escape southwestward from the peninsula. About April 10, 1950, however, a

Turkey Vulture was picked up exhausted at East Port Medway, Queen's County, as reported by Griscom (1950: 192).

3. The coastal nature of the records is apparent.

4. The bird is a rare visitant, mainly in fall and winter, in the coastal areas of the province.

PRINCE EDWARD ISLAND

No records found.

NEWFOUNDLAND

We find one record for Newfoundland: fall, 1905, Renews, 1 taken (Brewster, 1906b: 221). Brewster cited reports indicating that the bird was shot "a few weeks before" Nov. 23, 1905, "near Renews, not far from the whale factory at Aquaforte." Renews is about 20 miles from Cape Race.

LABRADOR

The two records which we have found are: Nov. 10, 1906, West St. Modest, 1 caught in fox trap (Townsend and Allen, 1907: 364); early summer, 1941, Nain, 1 taken (Sutton, 1942: 304–305).

According to Dr. Harrison F. Lewis, West St. Modest is on the Strait of Belle Isle. Nain is in Lat. 56° 40′ North, considerably farther north than Moose Factory, James Bay, where a Turkey Vulture was taken in June, 1898 (Fleming, 1903: 66). The Nain specimen, which thus constitutes the most northerly record for the species for eastern North America, is in the Louis Agassiz Fuertes Memorial Bird Collection, Cornell University.

SUMMARY

This paper reviews the occurrence of *Cathartes aura septentrionalis* in New England and eastern Canada, through 1949, as follows:

1. The bird's history in southwestern Connecticut and southwestern Massachusetts is described in the text.

2. All records for the remainder of Connecticut and Massachusetts, as well as for Rhode Island, are arranged in tabular form to show monthly and annual occurrence.

3. All records are listed for northern New England and eastern Canada (east of Ontario).

From these data, the following generalizations may be drawn:

1. For years, vagrant Turkey Vultures occasionally wandered northward into New England and the Maritime Provinces.

2. Reflecting the general northward advance which became evident in the 1920s, Turkey Vultures began to appear far more regularly in parts of Connecticut and Massachusetts in the 1930s and 1940s.

3. In 1947 the bird was found nesting in New Haven County, Conn., and it probably has nested in Fairfield and Litchfield counties, Conn., and in southern Berkshire County, Mass.

4. The bird appears to enter southern New England along two main channels: (1) coastally; and (2) northeastward across western Connecticut and Massachusetts.

5. North of Massachusetts, the Turkey Vulture remains a rare or occasional visitant, occurring more frequently in Maine, New Brunswick, and Nova Scotia than it does in Vermont and Quebec.

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72 Fairfield Ave., Holyoke, Mass., and Sunapee, N. H., August 15, 1950.

THE ROADSIDE CENSUS AS A METHOD OF MEASURING BIRD POPULATIONS

BY JOSEPH C. HOWELL

INTRODUCTION

THE subject of the measurement of bird populations has been extensively treated by Kendeigh (1944). Kendeigh's paper orients the roadside census in relation to other types of censuses. It has been used as a method of determining relative abundance and not absolute or true abundance. In relative abundance the number of birds reported is not the actual total number present in the area censused but an unknown proportion of the actual total, while in absolute or true abundance the number of birds reported is the total number of individuals present per unit of area (preferably given in terms of birds per 100 acres).

The roadside census is an enumeration of the birds contacted along secondary roads, usually from a moving automobile. Nice (1921) used the roadside census to study Oklahoma bird populations in 1920. Since then it has been used by a number of other workers. It has been used to study many species of birds, but usually the individual species chosen have been the more conspicuous ones. Perhaps it has been most widely used to measure population fluctuations of the Ring-necked Pheasant (Fisher, Hiatt, and Bergeson, 1947).

My objective in this study has been to measure population changes and trends in a large area. The area selected was Knox County, Tennessee. The population in an area of this size is too great to be more than sampled. It was the need for a method of securing large population samples over a large area in a limited time that led to the selection of the roadside census. The term population as used in this paper refers to the total number of individuals of both sexes and all ages (other than nestlings) occurring in Knox County.

Knox County lies within about 20 miles of the eastern boundary of Tennessee and is a little nearer to the northern than the southern boundary. Its greatest distance from east to west is about 35 miles and from north to south it is a little over 20 miles. The county has an area of 517 square miles. It lies in the Valley and Ridge Province (Fenneman, 1938), an area lying along the Tennessee River and characterized by many long parallel ridges and intervening valleys. The average elevation is a little less than 1000 feet. Seventy-two per cent of the county is in farms. Ecologically the county is about 60 per

cent within the Yellow Pine-Hardwoods general forest type and 40 per cent Upland Hardwoods.

On each census a recorder was present to make a record of the nature of each contact with a bird. This study would have been impossible without help from numerous volunteer cooperators. I am indebted to a considerable number of persons for occasional assistance, but my greatest gratitude is to my most consistent helpers, my wife Candace, Dr. C. J. Craven of the University of Tennessee Department of Physics, and Mrs. R. A. Monroe.

Dr. George E. Albert, of the University of Tennessee Department of Mathematics, carried out certain statistical treatments of the data and provided technical advice as to how the other data should be treated. Dr. James T. Tanner, of the University of Tennessee Department of Zoology and Entomology, helped in the planning of the problem and also read the manuscript critically.

Sumner A. Dow and Andrew J. Meyerriecks, students at the University of Tennessee, were largely responsible for making the absolute censuses of Areas 1 and 2.

DESIGN OF THE CENSUS

In determining relative abundance it is essential to select a unit of measurement. The three kinds of units available are divisions of time, linear distance, or area. Time was used in this study. Dice (1930) recommends that the hour be used as the time unit for measuring relative abundance. This has important advantages but was not used in this study because the samples secured during intervals of an hour were often small for statistical purposes. It was to secure larger samples that the unit adopted was a period of four hours. These four-hour periods are referred to as trips or censuses. No use is made in this study of units of time shorter than four hours.

The time of day at which each count is made has a pronounced influence on the number of birds enumerated. The hours just after sunrise and shortly before sunset are those of greatest activity. To take advantage of these two peaks in daily activity rhythm it was decided to divide the censuses evenly between mornings and afternoons. The morning censuses were scheduled to begin near sunrise, as soon as the light was strong enough to permit safe sight identifications and evening ones timed to end just before the light failed.

The number of censuses taken each month was set at ten, since that was the largest number that other responsibilities permitted. (Occasionally it was impossible to complete this many censuses and only seven each were taken during August and October, 1947, and eight

each during December, 1947, and January, 1948.) Five censuses in each month were planned for the morning and five for the afternoon.

In this study the following census method was used. An automobile was driven at speeds of five to ten miles-per-hour along secondary roads and every individual bird which was seen or heard was enumerated. At frequent intervals, often when unidentified individuals were encountered, the automobile was stopped and spot counts were made. These stops were of only a few minutes' duration in most cases, but they were important in that the sounds which were masked by the noise of the moving car could then be picked up.

A record was kept for each census on which was placed the nature of the original contact which was established with each individual. The record was kept by a helper, leaving the census taker free to count the birds and drive the car. In recording each contact with a bird a symbol was used to show whether the bird had been initially contacted through its song, its call, or through seeing it. A mimeographed form was used for the record on which were listed all of the common species of birds. The identity of some individuals could not be established, and these were recorded under the headings "unidentified" or "unidentified sparrow."

The choice of routes was made with the primary aim of securing ones that would be representative of the various areas within the county. Five routes were eventually selected which averaged about 25 miles in length and passed through the more important types of environment within the county, excepting only those of the urban and suburban areas of the city of Knoxville. Since the roads tended to follow the valleys and to avoid the ridges, roads were chosen which compensated for this ecologically undesirable situation. In selecting census routes it is necessary to avoid the heavy traffic of highways, and it is desirable to avoid roads with gravel on them for they are noisy. It is important to select roads which are passable at all times and under adverse weather conditions.

In order that a continuing series of roadside censuses may be comparable it is essential that they be as uniform as possible. The individual birds observed by the census taker should be the only ones recorded. The perfect record keeper would take no action that would influence the observer. Binoculars should always be used.

Ideally, censuses should be taken in such a manner that as many factors as possible between groups of censuses will be equal. If they are equal they may be cancelled out since they have the same affect on each group. These censuses were planned to cancel out many such factors. No comparisons are based on units that are smaller than a

month. During each month throughout the year the same five routes were censused, which cancelled out differences in habitat. The lengths of the trips were strictly equal in time and equal, or almost so, in miles travelled. It was assumed that certain inequalities cancelled out during each month. For example, no corrections were applied to compensate for differences in temperature or the amount of wind, precipitation, and sunshine. Personal efficiency and mechanical interference from the automobile were treated as constants.

RELATIVE ABUNDANCE OF INDIVIDUAL SPECIES

The first roadside census of this study was taken on July 13, 1947. Between that date and the end of September, 1947, a total of 15 censuses was completed. On the basis of the experience thus gained certain changes were made in the method of taking censuses. A new series was begun in October, 1947, and was carried through a full year.

Two important characteristics of the data secured from these censuses deserve special mention. The counts obtained from roadside censuses are not directly comparable between species, nor are they comparable for the same species from one season to another. The underlying factors which are responsible for both of these characteristics are many, but they possess one thing in common; they affect the conspicuousness of the birds counted.

Of the many factors which affect the conspicuousness of species the physical characteristics of size, color, and form are important. Of great influence also is the behavior of a species—the duration and frequency of its songs and calls, reproductive pattern, feeding habits, flocking habits, flight characteristics, and wariness. In the case of certain species the environment is the most important single factor affecting conspicuousness. These factors and complexes of factors vary widely from species to species in their importance and most of them vary also with the different seasons.

If it were not for these differences in conspicuousness, it would be possible to count the individuals of each species observed in a certain area and use the totals for the various species to indicate directly their relative abundance. For example, if Killdeers and Meadowlarks are equally conspicuous, then the number of each which we observe while driving along a mile of road on say a morning in late August will correctly reflect their relative abundance. Suppose we count 10 Killdeer and 20 Meadowlarks; then we can accurately state that Meadowlarks are twice as abundant as Killdeer.

Actual examples of species having equal conspicuousness must be relatively unusual. Certain species are many times as conspicuous as

others. If during our drive along the road mentioned above we had observed two Grasshopper Sparrows, we would hardly have been justified in concluding that Meadowlarks were ten times, and Killdeer five times, as abundant as Grasshopper Sparrows. At this season Grasshopper Sparrows are extremely inconspicuous from roads since they have ceased singing and they remain on the ground concealed by the cover which they inhabit. In order to compare the relative abundance of the Grasshopper Sparrow with that of the two more conspicuous species, some allowance must be made for the difference in conspicuousness.

These differences in conspicuousness stand squarely in the path of comparisons between the relative abundance of different species. A number of ornithologists have attempted to weigh these factors of conspicuousness and assign them a definite value known as an index or coefficient of conspicuousness. In conspicuous birds a low value for conspicuousness is assigned, while species which are difficult to find are given high ratings. By the proper application of the conspicuousness ratings the differences in conspicuousness between species are compensated. Colquhoun (1940) equates differences in conspicuousness by means of a coefficient of conspicuousness derived by dividing the number of individuals per acre (determined by an absolute census) by the number of birds actually observed per hour.

The writer used a modification of the Colquhoun method to secure percentages, instead of coefficients, of conspicuousness for two areas in Knox County. The method used was to determine the absolute population (through breeding bird censuses) of a strip extending along 3000 feet of road and back from the road on each side to a distance of 500 feet. Following this, four roadside censuses of four hours each were taken by driving back and forth along these 3000 feet of road. The percentages of conspicuousness for each species were secured in the following manner. The total number of individuals which would have been seen, if every individual of each species known to be within the census strip had actually been encountered on each run along the 3000 feet of road, was determined by multiplying the number of runs made by the known population of the census strip. The total number of individuals of each species actually contacted on all four trips was then divided by this calculated total. The figures thus obtained are the percentages of the absolute population of each species which were found by this set of four roadside censuses. They are a measurement of the conspicuousness of each species, and they are also a measurement of the degree of efficiency of the roadside census for each species.

Two areas were studied in this manner. Area 1 was largely in yellow pines and hardwoods, but had some open areas along the road. It was censused on May 22, 26, 29, and 30, 1949. Area 2 was in farm land which was used for pasture and for the production of hay, corn, oats, and lespedeza. Some of the oat fields had been cut before the roadside censuses were taken. Area 2 was censused on July 28, 30, 31, and August 2, 1949. In both areas roadside censuses were begun just before the absolute censuses were completed, and were finished a few days after the completion of the absolute censuses.

Table 1 contains the data for the species which are thought to be fairly represented. Many species are omitted since they do not remain in their nesting territories to feed, or their territories are so large that they cannot be censused on the small scale of this study. Among the species omitted are the following: Turkey Vulture; Black Vulture, *Coragyps atratus;* Cooper's Hawk, *Accipiter cooperii;* Broad-winged Hawk, *Buteo platypterus;* Sparrow Hawk, *Falco sparverius;* Chimney Swift; Barn Swallow, *Hirundo rustica;* Purple Martin; Common Crow; Starling; and English Sparrow. Some species are omitted since they had ceased to hold territories during the times at which the two studies were made and were feeding or caring for their broods at points outside of their territories.

The number of individuals of each species assigned to each area was determined as follows. A map was made of the territory of each pair of birds. If the territory lay entirely within the study area, two individuals were credited to the proper species. If half of the territory lay within the study area, only one individual was assigned to the species. In some cases fractions of individuals were assigned to a species if only a part of a territory lay within a study area. Where young were known to be present and out of the nest they were included in the total for the species. It was assumed that singing males were mated or that there were an equal number of unmated females.

The percentages of conspicuousness are valuable in proportion to the amount of data on which they are based. No percentages of conspicuousness are given for species represented by fewer than four individuals. In each area the roadside censuses were completed in a period of less than a week. They should be representative of the species for that time and place, but if the time or place is changed it is certain that the percentages of conspicuousness will also change. At different stages in the life history of a species its percentage of conspicuousness will change. Thus only a series of such percentages covering many habitats over a specific interval of time can give really representative values for differences in conspicuousness.

TABLE 1

PERCENTAGES OF CONSPICUOUSNESS AND AVERAGE CONTACT DISTANCES OF CERTAIN BIRDS AS DETERMINED BY ROADSIDE CENSUSES OF AREAS HAVING A KNOWN POPULATION

SPECIES	AREA 1		AREA 2		SPECIES	AREA 1		AREA 2	
	Percentages of Conspicuousness	Average Distances in feet	Percentages of Conspicuousness	Average Distances in feet		Percentages of Conspicuousness	Average Distances in feet	Percentages of Conspicuousness	Average Distances in feet
Turkey Vulture *Cathartes aura*	X*	X	X	1550	Blue-gray Gnatcatcher *Polioptila caerulea*	10	150	X	X
Bobwhite *Colinus virginianus*	X	X	12	700	Loggerhead Shrike *Lanius ludovicianus*	X	X	24	200
Killdeer *Charadrius vociferus*	X	X	X	800	Starling *Sturnus vulgaris*	X	X	X	350
Mourning Dove *Zenaidura macroura*	X	X	X	350	White-eyed Vireo *Vireo griseus*	5	250	X	X
Yellow-billed Cuckoo *Coccyzus americanus*	7	400	X	X	Red-eyed Vireo *Vireo olivaceus*	10	350	X	X
Chimney Swift *Chaetura pelagica*	X	550	X	650	Kentucky Warbler *Oporornis formosus*	9	300	X	X
Pileated Woodpecker *Dryocopus pileatus*	X	600	X	X	Yellow-throat *Geothlypis trichas*	8	200	X	X
Phoebe *Sayornis phoebe*	X	200	X	X	Chat *Icteria virens*	13	250	X	X
Wood Pewee *Contopus virens*	X	X	X	800	Hooded Warbler *Wilsonia citrina*	6	250	X	X
Purple Martin *Progne subis*	X	650	X	650	English Sparrow *Passer domesticus*	X	X	X	400
Blue Jay *Cyanocitta cristata*	X	350	X	X	Eastern Meadowlark *Sturnella magna*	X	X	15	350
Crow *Corvus brachyrhynchos*	X	650	X	1000	Red-winged Blackbird *Agelaius phoeniceus*	X	X	11	450
Carolina Chickadee *Parus carolinensis*	13	100	X	X	Summer Tanager *Piranga rubra*	28	250	X	X
Tufted Titmouse *Parus bicolor*	3	X	X	X	Cardinal *Richmondena cardinalis*	14	200	X	650
Carolina Wren *Thryothorus ludovicianus*	9	300	X	700	Indigo Bunting *Passerina cyanea*	12	200	24	350
Mockingbird *Mimus polyglottos*	X	X	19	200	Eastern Goldfinch *Spinus tristis*	X	X	17	300
Brown Thrasher *Toxostoma rufum*	X	X	1	X	Red-eyed Towhee *Pipilo erythrophthalmus*	14	250	X	X
Robin *Turdus migratorius*	10	350	X	X	Grasshopper Sparrow *Ammodramus savannarum*	X	X	10	250
Wood Thrush *Hylocichla mustelina*	3	X	X	X	Field Sparrow *Spizella pusilla*	5	250	10	550
Bluebird *Sialia sialis*	X	X	X	350	Song Sparrow *Melospiza melodia*	X	X	20	400

* X indicates that the available data are too limited to justify the use of a definite figure.

Considering only the species in Area 1 the percentages of conspicuousness range from 3 to 28. The extreme percentages show that the Summer Tanager is more than nine times as conspicuous as the Wood Thrush. At this time the males of the two pairs of Wood Thrushes had virtually stopped singing and presumably had small young in their respective nests. Since neither pair ranged regularly across the road, they remained hidden in the woods on either side of the road. The male Summer Tanagers (there were three), on the other hand, were singing frequently and loudly. Individuals of both sexes scolded at most of the stops. The thrushes were never seen in or flying through the tops of the large trees, whereas the tanagers were usually there and hence easier to contact.

The mean percentage of conspicuousness for the 18 species of Area 1 which were represented by four or more individuals was 10. The Summer Tanager is in a class by itself since its percentage of conspicuousness is twice that of the two next ranking species, the Cardinal and the Towhee. From these percentages it is apparent that in a wooded area it is common for one species to be twice as conspicuous as another. If the two species with the lowest percentage of conspicuousness are omitted, then it is evident that very few species are three times as conspicuous as any others. In the farm lands of Area 2 the range of percentages of conspicuousness is greater than it was in Area 1. Both the Loggerhead Shrike and the Indigo Bunting are 24 times as conspicuous as is the Brown Thrasher. At the time of the year when this set of censuses was taken the Thrasher has ceased singing entirely and rarely leaves the shelter of the thickets or hedgerows, making it a very difficult species to locate. The mean percentage of conspicuousness for the 11 species on Area 2, included in Table 1, is 15.

The effect which percentages of conspicuousness have when they are applied to the observed population indices of various species is shown in Table 2. The population index as used in this study is simply the average number of individuals of a species observed during the censuses taken during a particular time interval. Thus in June, 1949, there was a total of ten censuses taken during which 283 Bluebirds were observed, giving a population index of 28.3.

The population indices in Table 2 are those for the month of May, or June, 1948. The figures for the Cuckoo, Chickadee, Gnatcatcher, Chat, and Bunting are for June, since these population indices are more accurately representative of these species for the period in late May, during which were taken the roadside censuses from which the percentages of conspicuousness were derived, than are the May figures. For example, during early May many Indigo Buntings have not yet

reached this area in their spring migration and others have not yet begun to sing; thus the population index for the entire month of May is lower than it would be for late May. The June figures, like those of late May, sample the population after the completion of the spring migration and after most males have begun to sing. The population

TABLE 2

RELATIVE ABUNDANCE OF CERTAIN BIRDS IN MAY OR JUNE, 1948, IN KNOX COUNTY, TENNESSEE, AS DETERMINED BY ROADSIDE CENSUSES, AND FOLLOWING ADJUSTMENT FOR DIFFERENCES IN CONSPICUOUSNESS

Species	*Observed*		*Adjusted*	
	Rank	*Index*	*Index*	*Rank*
Yellow-billed Cuckoo	13	3.5	5	12
Carolina Chickadee	7	16.3	13	9
Carolina Wren	9	14.3	16	6
Robin	4	34.1	34	3
Blue-gray Gnatcatcher	12	5.9	6	11
Red-eyed Vireo	8	14.8	15	7
Kentucky Warbler	14	1.6	2	14
Yellow-throat	5	20.0	25	5
Chat	10	11.8	9	10
Hooded Warbler	15	0.6	1	15
Summer Tanager	11	11.0	4	13
Cardinal	2	40.8	29	4
Indigo Bunting	1	64.6	54	2
Red-eyed Towhee	6	19.7	14	8
Field Sparrow	3	40.3	81	1

indices for the other species are for May. Each population index has been adjusted for differences in conspicuousness by dividing it by the percentage of conspicuousness for that species. The percentages of conspicuousness used are those found in Table 1 under Area 1. To make comparisons between species easier the decimal point has been moved one place to the right in the adjusted index, and the nearest whole number so produced has been used. The rank of each species is given before and after adjustment for differences in conspicuousness.

Another method of adjusting differences in conspicuousness among various species of birds is described by Kendeigh (1944). This method rests on the assumption that the conspicuousness of a species is directly proportional to the average distance at which an observer becomes aware of the individuals of that species. Each of the average contact distances appearing in Table 1 is the average distance of a number of contacts with individuals of a particular species in which the distance between the observer and the individual was estimated. The presence of numerous markers at distances of 250 and 500 feet from the road helped greatly in obtaining reasonably accurate estimates. The average distances have been rounded off to the nearest

multiple of 50 feet; 50 feet was the limit of accuracy used in making estimates. Table 1 includes a number of these average contact distances; it also includes percentages of conspicuousness for some of the same species. It should be expected that birds with long average contact distances would also have high percentages of conspicuousness since both of these are used as measurements of conspicuousness. However, such is not the case. For example, the Yellow-billed Cuckoo has an average contact distance of 400 feet and a percentage of conspicuousness of 7, whereas for the Carolina Chickadee the average contact distance is only 100 feet, but the percentage of conspicuousness is 13. By one method the Cuckoo is four times as conspicuous as the Chickadee, but by the other method the Chickadee is almost twice as conspicuous as the Cuckoo.

No means was found by which to resolve the differences between the two methods. The field observations on which Kendeigh based his method were carried out during the winter. At this season the factors affecting conspicuousness have entirely different values than they do during the summer. For example, in winter, song and the screening effect of vegetation are much less important than during summer.

It is possible that the two methods may be complementary, the percentage-of-conspicuousness method being indicated during the breeding season and the average-contact-distance method being applicable during the remainder of the year. Thus a method of equating differences in conspicuousness would be available at all seasons.

MONTHLY CHANGES IN ABUNDANCE OF INDIVIDUAL SPECIES

There are population changes occurring during all units of time for most species in an area as large as Knox County. The roadside census should be used to measure only the changes occurring during units of time which are sufficient to permit sampling areas which are large enough to be representative. How large such areas should be can scarcely be objectively determined, and they will usually be dictated by such practical considerations as available personnel, time, and funds. For this study it was impractical to secure the data necessary for determining population changes for time units smaller than months. The individual roadside censuses within any month are not comparable since they differ in either the route taken or the time of day. For each month, however, there is a set of ten censuses which are matched as nearly as possible with sets taken during the other months of this study.

In comparing the numbers observed for a particular species in different months it is well to remember that the numbers observed

may reflect differences other than true population changes. This is particularly true with seasonal changes in conspicuousness. These differences have already been discussed.

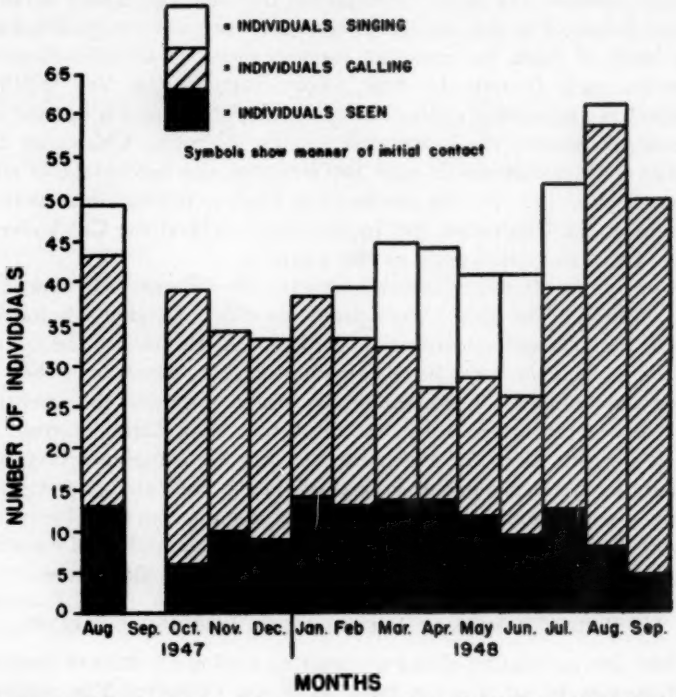

FIGURE 1.—Monthly changes in populations of the Cardinal as determined by a series of roadside censuses.

Figure 1 is a histogram of the monthly population changes of the Cardinal as observed during roadside censuses. Since the species is not migratory, this factor may be ruled out. The population of the Cardinal may be expected to reach a peak during the breeding season and then to fall without interruption until the following breeding season. An examination of the histogram does not show this to be the case. It will be seen that the observed population does drop during October, November, and December, but rises in January. This rise is probably due to some unusually large counts in January, as is indicated by the statistical analysis presented later. In February the observed population rose again. However, a new factor is introduced in February, for the Cardinal begins singing. Prior to February the

individual Cardinals counted were either seen or heard calling. To place the February observed population counts on the same basis as those of the fall and winter, those birds initially found through their songs during February must be omitted. When this is done,

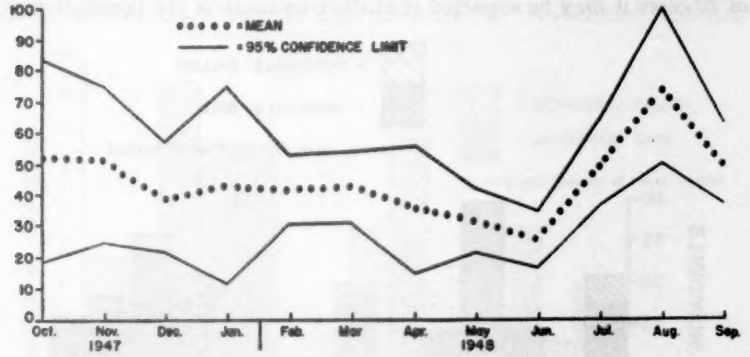

FIGURE 2.—Mean observed monthly populations of the Cardinal as determined by a series of morning roadside censuses.

we find there is an observed population drop as would be expected. In subsequent months also, the individual Cardinals contacted initially through song were omitted in determining the observed population changes.

If the Cardinal data for each month (omitting the individuals initially found through hearing them sing) are treated statistically, the range within which the actual mean lies for such a series of censuses can be determined within certain limits of accuracy. It is essential

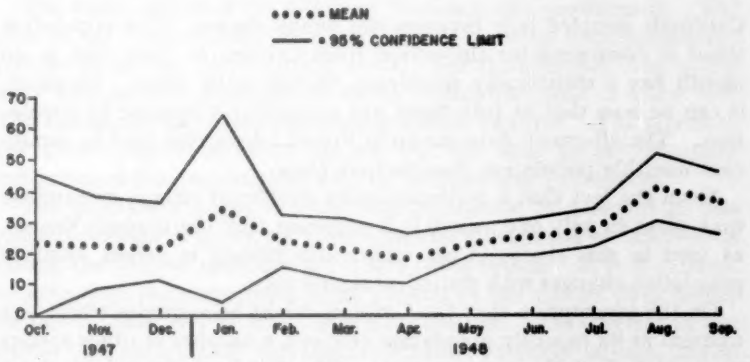

FIGURE 3.—Mean observed monthly populations of the Cardinal as determined by a series of afternoon roadside censuses.

that the morning and afternoon counts be treated separately for, as will be shown later, the morning counts average significantly higher.

In Figure 2 are shown the monthly averages for the censuses taken in the morning. The 95 per cent confidence limits indicate that in 19 of 20 cases it may be expected that the true mean of the population of

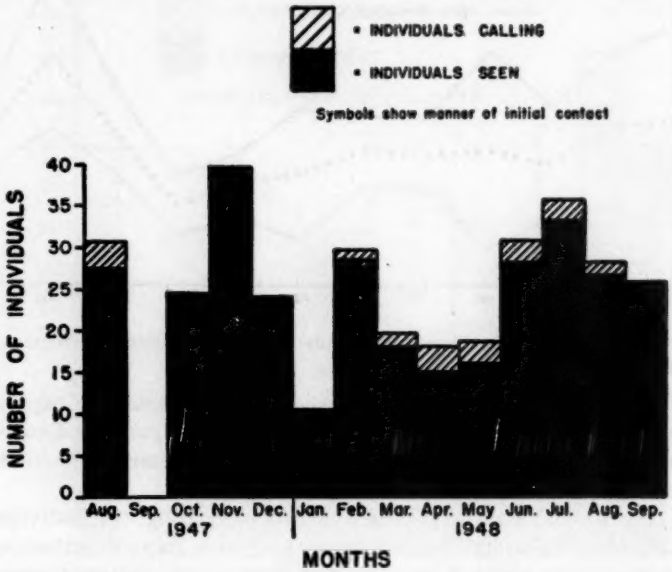

FIGURE 4.—Monthly changes in populations of the Mourning Dove as determined by a series of roadside censuses.

Cardinals sampled falls between the values shown. The population trend is downward for the period from October to June, but in no month has a statistically significant change taken place. However, it can be seen that in July there was a significant increase in population. The afternoon data shown in Figure 3 indicated that no significant monthly population changes took place.

From the fact that a mathematically significant change in numbers took place in only one month it is apparent that the roadside census, as used in this study, is not sufficiently refined to reflect monthly population changes with statistical significance.

On the assumption that the Cardinal might be a species which was unusual in its monthly population changes, a number of other species were studied in the same manner. The Cardinal showed the least month-to-month variation of any of the species studied.

While this type of census is such that the findings do not have statistical significance for *monthly* population changes, some of the findings do provide suggestive and tentative answers to local problems in the midwinter status of certain species. For example, the data on the Mourning Dove indicate that there are fall (November) and late

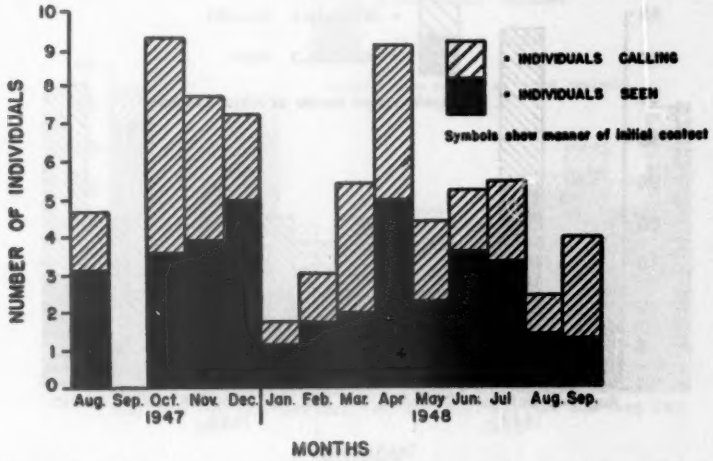

FIGURE 5.—Monthly changes in populations of the Flicker as determined by a series of roadside censuses.

winter (February) population peaks separated by a midwinter (January) low (Fig. 4). These data are those to be expected for species which are more numerous as migrants than as winter residents.

The winter status of the following species is also problematic. The data on the Flicker, *Colaptes auratus* (Fig. 5) show the same population picture as that for the Mourning Dove. For the Blue Jay (Fig. 6) the same may be true, although the spring population peak is a low one. The Bluebird (Fig. 7) has similar population changes. The status of the Crow (Fig. 8) is better known, but the data do provide some indication of the proportion of migrant and resident individuals.

The monthly changes in total bird population as reflected in this roadside census (Fig. 9) point to a greater population of individuals during the late fall months than at any other season. It is of interest to note that there are more birds present in the winter than in the summer. This may be more apparent than real. Yet it is during the winter that the Starling is present in greatest numbers; in fact, half of all the individuals seen during November and on through February were Starlings.

The monthly changes in the number of species observed in this area (Fig. 9) are independent of the monthly changes in the number of individuals observed. These changes are quite regular and show nothing of an unexpected nature.

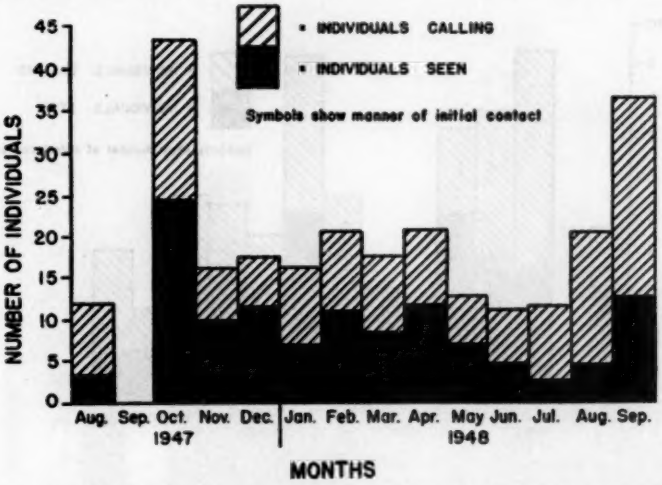

FIGURE 6.—Monthly changes in populations of the Blue Jay as determined by a series of roadside censuses.

ANNUAL CHANGES IN ABUNDANCE

The roadside census may be used to measure population changes from year to year. The design of this set of censuses is well suited to the making of comparisons between different years, or between the same seasons of different years. It is possible to match the censuses of the past very closely when carrying out a new set of censuses.

During the summer of 1949 a series of roadside censuses was taken to secure data on population changes between the summers of 1948 and 1949. Ten censuses were taken in each of the months of June, July, and August, 1948. In 1949 a comparable series of censuses was taken. The 1949 series was matched with that of 1948 in such a way that each census for 1949 was paired with one in 1948 as to the route taken, the time of the month, and the hours of the day. Thus in each summer the total of the hours spent in the field was 120. The sample of birds counted in the summer of 1948 was 32,426 and in 1949 it was 34,830. During both summers over a thousand birds were counted on the average census.

The population level for each species for each month is shown by means of population indices. The population index for each species was secured by simply taking the average number seen per census during a particular month.

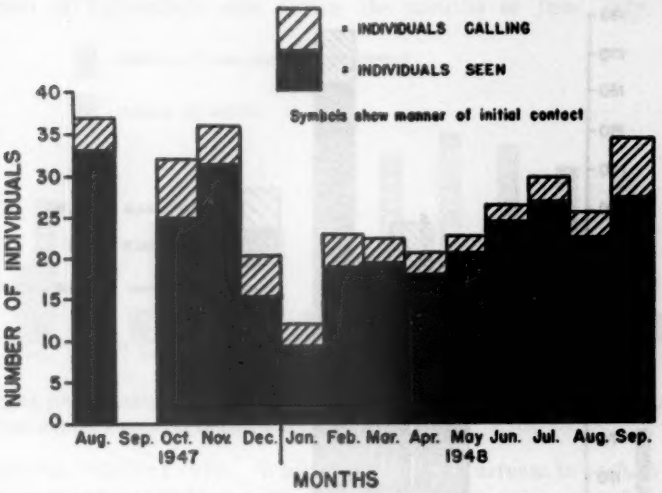

FIGURE 7.—Monthly changes in populations of the Bluebird as determined by a series of roadside censuses.

Such population indices have a complex and changing relationship to the real or absolute population of a species. It is certain that changes in conspicuousness play an important part in this relationship. In this comparison where the individual censuses are matched, it is thought that adequate allowance is made for the major factors of conspicuousness influencing the population indices and that the changes observed between the two summer seasons reflect true fluctuations in population levels. It is assumed, for example, that the factors affecting the availability of the Cardinal to censusing on a morning in early June along a particular route would be the same in 1948 and in 1949. This might not be true if the two seasons were unlike in terms of earliness or lateness.

Determination of the earliness or lateness of a particular season may be done in many ways. In this study the method used was to compare the times at which the volume of song of the various species began to drop. Since the volume of song reflects the stage in the reproductive cycle of many species (particularly at the summer season since few species sing as they molt), it may be used as an index to the earliness or

lateness of the season. The actual system used was to compare the percentages of original contacts which were made through singing birds for the same periods in the same seasons of the two years being compared. For example, 66 per cent of the original contacts estab-

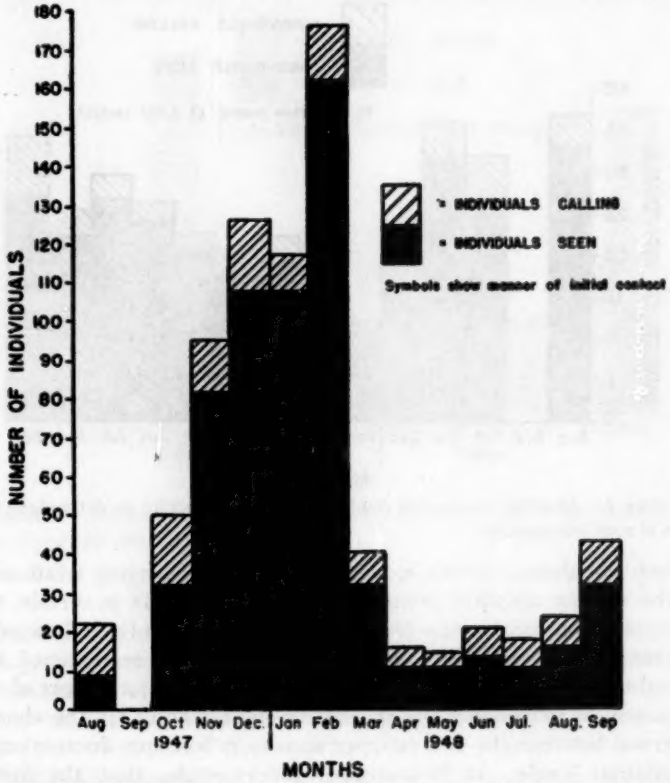

FIGURE 8.—Monthly changes in populations of the Crow as determined by a series of roadside censuses.

lished with Indigo Buntings during four censuses in early July of 1948 were made with singing males. For a matched set of censuses for 1949 the percentage was 76. For a similar set of censuses taken in mid-August of 1948, 15 per cent of the original contacts were with singing males, and 13 per cent were with singing males in 1949. These figures indicate that about the same percentage of birds was at the same stage in the reproductive cycle at the same calendar dates during the two seasons. Therefore, in comparing the summer seasons of

1948 and 1949 no allowance needs to be made for the relative earliness and lateness of the two seasons.

In presenting the data secured for the two summers the monthly levels of total population are shown first. Table 3 presents the total number of individuals seen during the months of June, July, and

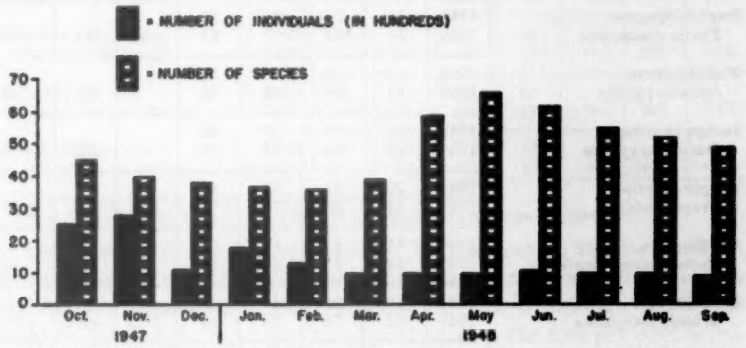

FIGURE 9.—Monthly means of the number of individuals and the number of species observed during a series of roadside censuses.

August for 1948 and 1949. While there was an increase in each of the summer months of 1949 over those of 1948, the increases are relatively small. In terms of percentage the total population for the summer of 1949 was about 7.5 per cent greater than in 1948. This increase in total population is not statistically significant.

TABLE 3

POPULATION INDICES FOR TOTAL POPULATION OF ALL BIRDS IN KNOX COUNTY, TENNESSEE

	June	*July*	*Aug.*	*Average*	*Change*
1948	11,275	10,605	10,546	10,809	
1949	11,574	11,858	11,399	11,610	+801

Table 4 contains the monthly population indices for the 24 species of birds which were the most common during the two summers under consideration. The column headed *Avr.* presents the average number of individuals (average of population indices) seen during each of the 30 trips taken during each of the two summers. The column headed *Chg.* lists the difference in the population index of 1949 from that of 1948 for each species. For example, on the average trip in the summer of 1948 there were 155 Starlings seen, whereas in the summer of 1949 there were 172 Starlings seen. The change therefore

TABLE 4

POPULATION INDICES FOR SOME COMMON BIRDS OF KNOX COUNTY, TENNESSEE

Species	*Year*	*June*	*July*	*Aug.*	*Avr.*	*Chg.*	*Sig.*	*Pct.*
Starling	1948	107	111	247	155			
Sturnus vulgaris	1949	126	129	262	172	+17	NS*	+11
English Sparrow	1948	76	71	83	77			
Passer domesticus	1949	81	102	77	87	+10	NS	+13
Field Sparrow	1948	54	58	57	56			
Spizella pusilla	1949	52	60	56	56	0	NS	0
Indigo Bunting	1948	65	65	35	55			
Passerina cyanea	1949	62	66	32	53	−2	NS	−4
Purple Martin	1948	20	42	83	48			
Progne subis	1949	14	88	77	59	+11	NS	+23
Cardinal	1948	41	52	61	51			
Richmondena cardinalis	1949	47	47	59	51	0	NS	0
Mockingbird	1948	46	39	29	38			
Mimus polyglottos	1949	62	56	35	51	+13	±4.6	+34
Mourning Dove	1948	31	36	28	32			
Zenaidura macroura	1949	35	46	51	44	+12	±10.9	+38
Chipping Sparrow	1948	39	35	27	34			
Spizella passerina	1949	39	32	24	32	−2	NS	−6
Song Sparrow	1948	46	36	10	31			
Melospiza melodia	1949	44	43	15	34	+3	NS	+10
Chimney Swift	1948	36	32	20	29			
Chaetura pelagica	1949	31	36	31	33	+4	NS	+14
Eastern Bluebird	1948	26	30	26	27			
Sialia sialis	1949	28	30	40	33	+6	NS	+22
Robin	1948	41	34	15	30			
Turdus migratorius	1949	38	21	13	24	−6	NS	−20
Red-eyed Towhee	1948	26	28	11	22			
Pipilo erythrophthalmus	1949	27	29	13	23	+1	NS	+4
Crow	1948	21	18	25	21			
Corvus brachyrhynchos	1949	24	16	29	23	+2	NS	+10
Cowbird	1948	10	14	47	27			
Molothrus ater	1949	9	18	31	19	−8	NS	−30
Yellow-throat	1948	26	28	6	20			
Geothlypis trichas	1949	23	27	7	19	−1	NS	−5
Carolina Wren	1948	13	16	21	17			
Thryothorus ludovicianus	1949	15	24	26	22	+5	±2.7	+29
Purple Grackle	1948	31	15	13	20			
Quiscalus quiscula	1949	34	6	15	18	−2	NS	−10

TABLE 4—(*Continued*)

Species	*Year*	*June*	*July*	*Aug.*	*Avr.*	*Chg.*	*Sig.*	*Pct.*
Eastern Meadowlark	1948	29	18	5	17			
Sturnella magna	1949	31	20	10	20	+3	NS	+18
Red-winged Blackbird	1948	22	11	(5)†	17			
Agelaius phoeniceus	1949	26	16	(25)†	21	+4	NS	+24
Carolina Chickadee	1948	16	18	22	19			
Parus carolinensis	1949	16	17	15	16	−3	NS	−16
Blue Jay	1948	11	12	21	15			
Cyanocitta cristata	1949	12	17	22	17	+2	NS	+13
Wood Thrush	1948	17	18	(1)†	18			
Hylocichla mustelina	1949	13	11	(1)†	12	−6	±4.1	−33

* NS indicates that the change was not significant statistically.

† The figures in parentheses were not used in determining the statistical significance.

is listed as + 17 for the year 1949. In the next to the last column headed *Sig.* is indicated whether or not the change for each species is statistically significant. The "Student's t" test (Snedecor, 1938) was used to determine the statistical significance at the five per cent level. For those species which showed a significant change the 95 per cent confidence limits of the change are shown. The final column headed *Pct.* shows the percentage of the change. The percentage of change was obtained by dividing the amount of change (*e. g.* + 17 for the Starling) by the 1948 average number of individuals seen (155 for the Starling). The monthly averages (population indices) for the month of August are not used for the Red-winged Blackbird and the Wood Thrush. In the case of the Blackbird an unusual sample (census count) made the 1949 data unusable. The Wood Thrush figures for August of the two years are comparable, but the species is so retiring (unavailable to censusing) in that month that the figures are radically different from those of June and July and should not be treated statistically with them.

The results indicate that among the common species studied none experienced a truly large fluctuation in population. Considered in terms of percentage of change from the 1948 population, no species underwent a change in population of 50 per cent. The greatest change in population level is the 38 per cent shown by the Mourning Dove. The average population change for these 24 species was 16 per cent. Those population changes which were statistically significant were all close to, or greater than, 30 per cent.

Of the four species which underwent statistically significant changes between the summer of 1948 and that of 1949, two, the Mockingbird and the Carolina Wren, are species which frequently suffer heavy

mortality during severe winters such as that of 1947–1948. The relatively mild winter of 1948–1949 very likely was responsible to a considerable extent for the population rise recorded during the summer of 1949. It seems probable that the same hypothesis would apply in the case of the Mourning Dove. The Wood Thrush, however, since it winters south of the United States, must have suffered population losses during either its migration or its winter residence. It is the only species to show a statistically significant decline in population.

The population changes of certain of the species which did not undergo changes of statistical significance are of interest. Those of the six native fringillids are of interest since they are so slight. Not one of them underwent a population change which was as great, in terms of percentage, as the average for the entire group of 24 species. The average change for the six is about four per cent. The average for the three turdids is 25 per cent, and for the four icterids it is 20.

A study of the monthly population indices in Table 4 shows that there is great variation among the different species in the adequacy of the sample taken. If the trends for each season are similar, it seems reasonable to assume that the sample was adequate. For example, the population of the Starling showed an increase in each summer month in both 1948 and 1949. Also the population index is greater for each month of 1949 than for the corresponding month of 1948. There are no obvious inconsistencies in the samples for this species.

In contrast to the regularity of the samples of the Starling population are the samples taken of the Red-winged Blackbird population. During June and July of the two years the samples are uniform enough in the trend shown for the two years, but the August samples are obviously not in keeping with trends established during June and July. An examination of the individual censuses taken in August makes it clear that the August data are not comparable with those of the earlier months. In August this species is no longer scattered widely among the many wet meadows in which it nested during June and July, but has left these marshy areas for corn fields and other farm lands. Not only does this species change its habitat preference, but it changes its social habits as well to form units which are larger than its relatively small nesting colonies. As a consequence of this organization into flocks of considerable size, it happened that more individuals were observed during one census in August, 1949, than on all of the other censuses of that month and all of those of August, 1948, as well.

Other species which form large flocks that are widely scattered present the same problem. The true population level of the English

Sparrow and of the Purple Martin is masked by their flocking habits. Neither species shows a consistent trend when the monthly population indices are compared. Such species are a special problem. A possible solution might lie in simply prolonging the individual censuses to the extent necessary to insure encountering at least one such large flock on each census. In this connection it is interesting to note that the censuses of the Starling seem quite satisfactory despite the fact that they are similar in their flocking habits. The difference would seem to lie in the fact that there are more flocks of Starlings, and therefore the possibility of overlooking the species entirely is less.

COMPARISON OF MORNING AND AFTERNOON DATA

A by-product of this study was a set of data permitting a comparison of the number of birds seen during the morning censuses with the number seen during the afternoon censuses. The morning censuses were begun as soon as the light was strong enough to permit identification, and the afternoon censuses ended when the light intensity was about the same as that at which the morning censuses were started. Thus the morning and afternoon censuses were matched as to light intensity.

Fifty-five morning censuses taken throughout the year were compared with the same number of afternoon censuses. Each morning census was paired with the afternoon census of the closest date. The routes censused were the same ones in both the morning and afternoon. The difference between the two groups of censuses proved to be statistically significant at the one per cent level. A total of 142,737 individuals was counted during these 110 censuses. Of these 88,302, or 61.8 per cent, were seen during the morning. The morning is, therefore, the better time during which to secure large samples of a bird population.

A check was made to determine whether or not there were any species of birds which were more available to censusing during the afternoon than during the morning. Only one such species was found. The Nighthawk, *Chordeiles minor*, censuses were consistently higher during the afternoons than during the mornings. A number of species were as likely to be found in the afternoon as in the morning.

SUMMARY

1. Relative abundance of individual species was found to differ from absolute abundance chiefly because of differences in conspicuousness.

2. Differences in conspicuousness were measured by determining the percentage of the known absolute population of a species in a certain area which was noted during a set of roadside censuses.

3. These percentages of conspicuousness ranged from 1 to 28.

4. Percentages of conspicuousness were secured only for species which maintained relatively small territories.

5. Percentages of conspicuousness vary with the season of the year, the habitat, and certain other factors.

6. Use of percentages of conspicuousness to adjust interspecific differences in conspicuousness is shown to affect greatly the ranking of species in order of abundance.

7. Monthly changes in population as observed during a set of roadside censuses are shown for the Cardinal in Figure 1; only during the month of July did a statistically significant change occur.

8. Data from roadside censuses are used to show graphically that the Mourning Dove, Flicker, Blue Jay, and Bluebird, while considered resident species, have higher populations during periods of migration than during mid-winter.

9. Data from roadside censuses are used to show graphically the monthly population changes of the Crow, thus providing an indication of the relative sizes of the wintering and resident populations.

10. The observed total bird population was highest in the late fall, and it was higher during the winter (due largely to the number of Starlings) than it was during the summer.

11. The number of species observed was found to vary independently of the number of individuals observed.

12. Thirty censuses taken during June, July, and August, 1948, were matched by a set of 30 censuses taken during the same months of 1949. Certain findings resulted from these two sets of censuses:

a. The total number of individuals observed was 7.5 per cent greater in the summer of 1949—not a statistically significant change.

b. The percentages of increase or decrease from one summer to the next ranged from zero to 38 among 24 common species selected for mathematical study.

c. Only population changes of about 30 per cent, or greater, were found to be mathematically significant; only four species underwent statistically significant changes.

d. The fringillids underwent much less population change than the mean change for the entire group.

e. The data secured on flocking species indicate that these samples are less reliable than are those of non-flocking species.

13. It was found during a series of 110 censuses, half of them taken during mornings and half of them taken during afternoons, that 61.8 per cent of all the individuals were counted during the mornings.

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THE HOUSE WREN BREEDING IN GEORGIA: AN ANALYSIS OF A RANGE EXTENSION

BY EUGENE P. ODUM AND DAVID W. JOHNSTON

TO US, the appearance of the House Wren, *Troglodytes aëdon*, as a nesting bird in Georgia has significance beyond the addition of a new species to the list of breeding birds for the state. In the first place, the phenomenon of southward invasion has been a subject of special interest to Georgia bird students for the past ten years. Secondly, the appearance of the House Wren fulfills the last of three predictions ventured by Odum and Burleigh in 1946. Finally, as a result of the work of Kendeigh and his associates at Cleveland, the physiological tolerances of the House Wren to temperature and other factors are known—enabling us to base a discussion of the limiting factors upon something more than pure theory. The writers are indebted to Mr. Chandler Robbins and Dr. John W. Aldrich for checking distribution records and to Dr. S. Charles Kendeigh for reading the manuscript.

The Georgia Record: On June 20, 1950, Odum heard the unmistakable song of the House Wren and was able to observe the bird for several minutes near the Veterinary Clinic Building on the Agricultural Campus of the University of Georgia. The next day, the authors found a pair of birds at this location and watched the female

carrying nesting material into the end of a pipe which formed part of a series of fenced enclosures for animals undergoing treatment at the clinic. The particular pipe selected by the birds was a brace set at an angle to the corner post. The pipe was just under two inches in inside diameter, and the bolt at the top constricted the entrance to about one inch. The nest was about nine inches down from the opening, and was designated as nest No. 1. On June 23, Johnston discovered another female and nest (nest No. 2) about 150 feet from nest No. 1; it was located also in a slanting brace pipe. This nest contained five nestlings which appeared nearly ready to leave the nest. Subsequent observation revealed conclusively that, while there were two females, there was only one male present. Of course there might have been a second male before we discovered the group. On June 26 the first egg was laid in nest No. 1, and on the same day the five young left nest No. 2; both the male and female were observed caring for these young. Two of the nestlings were converted into study skins after we failed to raise them in captivity. Only four eggs were laid in nest No. 1, the last being laid on June 29. All these eggs hatched between July 11 and 13.

In the meanwhile, on July 10, Johnston observed all three adults together near old nest No. 2, and saw a female (probably the one from nest No. 2) go into another pipe near by. This pipe was found to contain a nest (No. 3) with five eggs and was located between nests 1 and 2. Since the eggs began hatching on July 18, it is evident that this set was started about July 2, only about six days after the young had left nest 2. Only three of the five eggs in nest No. 3 hatched. These three young, together with the four in nest 1, were banded and, as far as we know, successfully left the nest. Female No. 2 was also banded. The male was observed to be active at both nests.

The pens in which all nests were located cover about one-half acre and are shaded by a grove of large, old, pecan trees. A number of pens were unused and were overgrown with tall weeds and bushes. Nests 2 and 3 were located among these weeds, but No. 1 was in the center of the used pens. The grove was surrounded by lawns or open grassy areas. The wrens were able to get their food and to carry on other activities mostly within the pen area, but the male was observed on a number of occasions to cross the lawn and a road to shrubbery around two nearby houses. Nest 1 was completely shaded throughout the day, but nests 2 and 3 were both located in pipes on the outermost fence row and were exposed to full sunlight most of the day.

To summarize, the two females and one male built three known nests. Since the House Wren is normally double-brooded, nest No. 2

may be regarded as belonging to the first nesting period; five eggs were laid and five young were fledged. The other two nests may be regarded as second nestings and contained four and five eggs, or an average of 4.5 eggs. Presumably, female No. 1 had a nest in the first period which was completed before the colony was discovered. The total known production, however, was 14 eggs with 12 birds fledged (including the two that were collected) and two eggs which failed to hatch.

Subspecific Identity: We felt it was important to know the subspecies of our birds in order to have definite information as to the probable racial stock from which the invading birds came. Accordingly, on July 18, after the young had hatched and could be cared for by the females, the male was collected. The skins of the male and the two nestlings were sent to Dr. John W. Aldrich, to whom we are indebted for making careful comparisons with specimens in the United States National Museum collection. The following is a direct quotation from his letter of August 4, 1950: "The Georgia breeding specimens of the house wren which you forwarded for identification, turned out to be referable to *baldwini*. As might be expected they most closely resemble the Appalachian mountain birds further north which are to a certain extent intermediate between typical *baldwini* and typical *aëdon*. As you guessed, your Georgia adult specimen is identical with West Virginia specimens. Unfortunately, our material of nestling *baldwini* is nil but your nestlings do not resemble at all comparable specimens from the northeastern seaboard." Breeding House Wrens collected in North Carolina by Burleigh have also been identified as *baldwini*, including a male taken at the extreme eastern section at Beaufort (Pearson, Brimley, and Brimley, 1942; Burleigh, 1937).

Analysis of the Invasion: As pointed out by Odum and Burleigh (1946), the amount and distribution of suitable habitat, as well as climate, may be direct limiting factors. In their paper, the southward invasion of three species, the Robin, *Turdus migratorius*, Song Sparrow, *Melospiza melodia*, and Chestnut-sided Warbler, *Dendroica pensylvanica*, was discussed and the conclusion reached that climate could not have been a limiting factor in establishing the southern boundary of the original range. On the other hand, an increase in suitable habitat plus an increase in population within the original range, and perhaps other biotic factors, were believed responsible for the invasions as observed. All these species, and most others which have shown marked range extensions in recent years, are either species of the forest-edge (*i. e.*, species requiring both trees and vegeta-

tion of grass or grass-shrub life form intermixed) or species of early seral stages of vegetation. White man's land-use practices have increased these types of vegetation greatly, giving species which are adapted to these types and which have inherently wide tolerance for climate a chance to spread. In the above mentioned paper it was suggested that the Blue-headed Vireo, *Vireo solitarius*, House Wren, and Horned Lark, *Eremophila alpestris*, might be expected to extend their breeding ranges in the Georgia region. These predictions were based on the fact that all three species had at that time (1945) become established as breeding birds on the Piedmont Region of North Carolina (for the first two species) and Alabama and Tennessee (for the lark), and there seemed to be no barriers, either climatic or of habitat, to prevent continued spread until they at least occupied all the Piedmont. The spectacular advance of the Blue-headed Vireo deep into the Georgia Piedmont in 1946–48 has already been reported (Odum, 1948). In the spring of 1950, William W. Griffin found the Horned Lark nesting for the first time in Georgia at Rome (personal correspondence). Thus, the nesting of the House Wren at Athens completes the picture in less than five years. In each of these cases, there was enough observation by bird students prior to the discovery of birds in new territory to make it certain that a real range extension was involved and not merely the discovery of previously overlooked breeding birds.

Prior to 1920 the House Wren was apparently unknown as a breeder south of Virginia or Kentucky (except possibly in extreme northeast Tennessee). There are several old records, including one of young birds at Greenville, S. C. in 1888 ("C. M. F.", 1888), but they are not well-documented and must be regarded as questionable. About 1922 the House Wren suddenly began to appear in the North Carolina Piedmont (Pearson, 1934), and within a few years it was recorded as breeding in widely scattered towns (Fig. 1) from Statesville near the mountains to Englehard and Beaufort on the coast (Pearson, Brimley, and Brimley, 1942). While Sprunt and Chamberlain (1949) did not list the House Wren as breeding anywhere in South Carolina, we have well-documented reports which indicate that the species has recently become established, at least on the upper Piedmont of the state. In the vicinity of Greenville, Mr. P. M. Jenness (personal correspondence) stated that he "had no record outside the normal spring migration period until July 5, 1942." At that time he observed a singing male enter a bird box. Conclusive evidence of breeding was obtained in 1945 when a pair nested in a box near his home and, since 1948, one or two pairs have been found nesting at each of two separate localities

in the city of Greenville. At Spartanburg, Mr. Gabriel Cannon wrote that no nesting House Wrens were seen "by the best informed members of the bird group" prior to 1949 when a singing bird was observed in July. In 1950, House Wrens were found in several localities within the city and conclusive evidence of nesting was

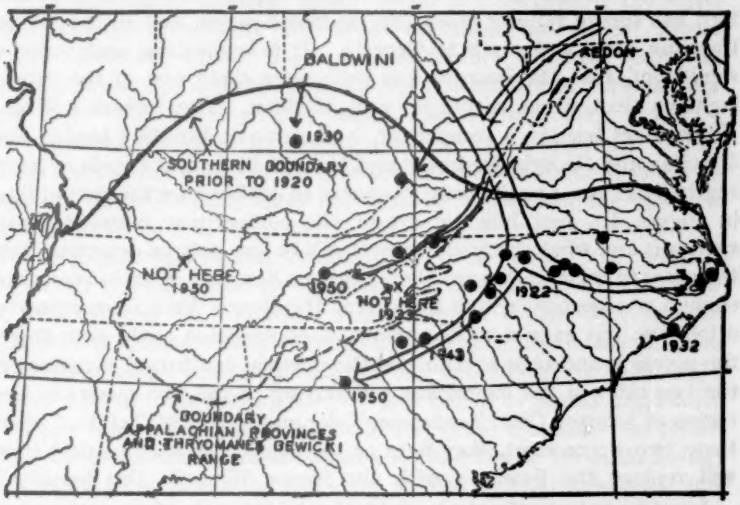

FIGURE 1. Distribution of the House Wren showing the southward extension of breeding range of the Ohio subspecies, *Troglodytes aedon baldwini*. Solid dots are localities where the House Wren has been recorded breeding since 1920, the dates being the first dates of authentic breeding in the indicated regions.

obtained at several places (Crick, 1950). Pickens (1927) reported that a friend found a House Wren nesting on his porch at Greenwood in 1925, but since the Carolina Wren, *Thryothorus ludovicianus*, so often nests on porches and is so often confused with the House Wren, this record may be considered questionable.

In Kentucky, the House Wren apparently did not nest in Lexington until 1930 (Allen, 1946). In Tennessee, it has been reported breeding at least as early as 1934 in the extreme northeast corner (Johnson City region). However, at Knoxville the House Wren nested "for the first time on record" in 1950. Dr. J. C. Howell found three pairs present in one area (Regional Reports, Aud. Field Notes, 4 (5): 276). Up to August, 1950, there was no evidence that the House Wren had yet bred in Nashville, or middle Tennessee generally, according to a letter received from Mr. A. F. Ganier.

With the above information on range extension to the north and the data on racial status, we may at least obtain a rough outline of the probable course of the southward invasion (Fig. 1). The birds which have reached Georgia are evidently of midwestern stock originating in the region of West Virginia where some mixing has occurred with the eastern stock, *aëdon*. Once east of the Appalachian mountains the bird has spread rapidly down the Piedmont region east to the North Carolina coast and south to Georgia. It is interesting, and perhaps significant, that the invasion has been more rapid east of the Appalachians than either within or west of them. The Bewick's Wren, *Thryomanes bewicki*, a competitor, is absent as a breeding bird in the Carolina and Georgia Piedmont and Coastal Plain, but breeds at least sparingly in the Appalachian Provinces as outlined by the dotted line in Figure 1. Just how important the competition between these species is and what the final outcome will be can only be determined in the years to come. It is not likely that the Bewick's Wren is numerous enough or vigorous enough to prevent the House Wren from entering a locality, but even a small amount of competition could slow down the invasion and thus account for the unequal southward progress on the two sides of the mountains. Referring to the two species in the region of Johnson City, Tennessee, Tyler and Lyle (1947) state, "when these two wrens meet, they fight to the death. It may be that time will replace the Bewick's with the House Wren in this locality."

Another noteworthy feature of the invasion is that progression appears to be in "jumps," rather than by steady, gradual expansion. The southward invasions of the Robin and the Blue-headed Vireo were definitely of this "paratrooper" type; that is, birds appeared at a considerable distance beyond the last known point and colonized locally, usually more than one pair appearing simultaneously. Indeed, this may actually be a common invasion pattern. In Georgia, the Robin, Blue-headed Vireo, and the Song Sparrow suddenly nested at points 100 miles from their former range without appearing at intermediate points. In the case of the House Wren, groups of birds have appeared rather suddenly at Spartanburg, Knoxville, and Athens, where bird students are active; to what extent intervening points are occupied has not been determined.

Limiting Factors: Kendeigh (1934) felt that on the basis of information then available, "the southward distribution appears to be controlled by high daily maximum temperatures and competition with the Bewick Wren." Experimentally, 93° F. was found to be a critical temperature for *T. a. baldwini* and the 86° F. average daily maximum

temperature isotherm was suggested as a limiting point beyond which the House Wren did not nest commonly. It is important to note that the former temperature was determined by actual experimentation, the latter being merely a correlation with the then existing southern range boundary. Recent climatic changes, if any, have tended towards increasing mildness which would aid northward invasions but which would actually discourage southward invasions. Biotic factors, therefore, rather than climatic factors were the probable factors limiting the original southern range boundary at Virginia and Kentucky. This conclusion, of course, assumes that there has been no fundamental change in the morphology and physiology of the species itself which would enable it to become more tolerant of southern climates. In any event, there has been an appreciable lag between the time of extensive habitat change and the occurrence of the invasion. Since a population buildup would likely occur within the original range first, this lag would be expected if environmental changes were the basic cause of the invasion. Thus, after the House Wren became an abundant species within its range as a result of man-made changes in the environment (that is, production of a vast amount of forest-edge habitat with suitable nesting sites) it then began to spread southward to occupy territory the climate of which it could tolerate. An interesting feature of the invasion is that the Ohio House Wren, *baldwini*, has reached Georgia and the east coast of North Carolina, and not the Eastern House Wren, *aëdon*, as one might assume and as did Pearson (1934). As previously indicated, future observation and study will be required to determine if the absence of the Bewick's Wren east of the Appalachians has anything to do with this distributional pattern. The present situation should provide an unusual opportunity to study further the relationship between these two species which occupy a similar niche.

While climate might not have been the absolute limiting factor in southward distribution in the original range (prior to 1920), it is quite possible that the species may now be approaching a point where climate will be more and more important in determining ultimate success and more of a barrier to further spread. The House Wren is believed to be relatively stenothermic as compared with the Robin and Song Sparrow, to mention two other species invading in the same territory. At least we now have an opportunity to analyze the situation and perhaps to venture predictions for the future.

Weather conditions during the months of May, June, and July, 1950, at Athens, where the species is at least starting to get a foothold, were about as normal as one could possibly expect. Average monthly

temperatures were no more than a degree from normal and precipitation was likewise near normal. There were no bad storms or unusually hot or cold periods. The first appearance of birds here, therefore, was not during an unusual breeding season, although the early spring and winter preceding had been unusually warm and dry. In Figure 2

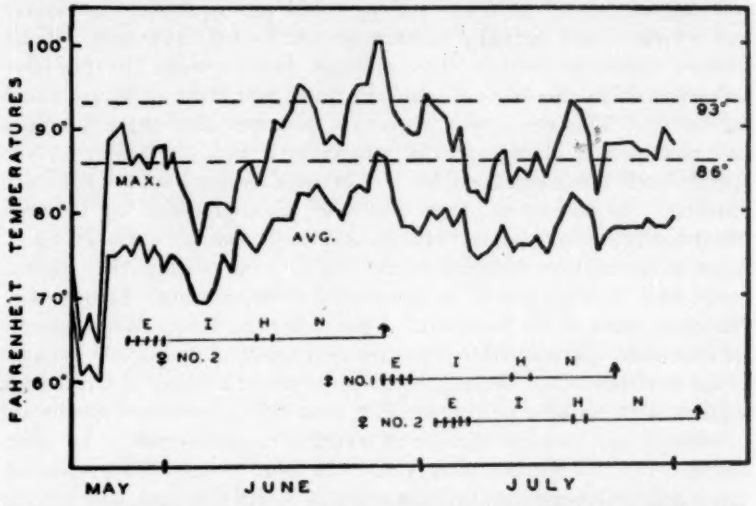

FIGURE 2. Daily maximum and average temperatures during egg-laying (E), incubation (I), hatching (H), and nestling period (N) of three broods of House Wrens at Athens, Georgia, in 1950. See text for explanation.

daily maximum and daily average temperatures for the known breeding period are plotted. The time of egg-laying of the first brood of female No. 2 was calculated from the known time of nest-leaving, assuming a nestling period of 15 days and an incubation period of 13 days (Kendeigh, 1941). As can be seen in this figure, there were about five periods during which maximum temperatures were above 86° F. (the limit originally suggested by Kendeigh) for several days at a time. Since Kendeigh (1934) has shown that the time of egg-laying is a critical period, it is important to note that egg-laying occurred in one of these hot spells in each of the three known clutches. In May the nights were cool and average temperatures lower than during other egg-laying periods, but the week during which female No. 1 was laying was the hottest of the breeding periods, the maximum temperatures being well above the 93° F. found by Kendeigh to produce physiological distress. It is important to note that only four eggs were laid at this time. Thus, egg-laying at Athens in 1950 occurred at about the most

unfavorable times possible as far as maximum temperatures were concerned. In spite of this and the fact that two nests were in the direct sunlight, nestlings were successfully raised, but their number was reduced. Thus, five eggs were laid in the nest of the first nesting period and an average of 4.5 in the two second nestings. This may be compared with a 6.5 average of the first set and 5.2 for the second set as found by Kendeigh and Baldwin (1937) for *T. a. baldwini* at Cleveland, Ohio. Also, two eggs of one of the second sets failed to hatch. Again Kendeigh has shown that the number of eggs decreases and the percentage of unhatched eggs increases with an increase in temperature.

Thus, it would seem that the Ohio House Wren can tolerate conditions on the Georgia Piedmont in an average year, but its reproductive potential is likely to be less than that farther north; in other words, temperature is exerting a limiting effect. Accordingly, climate appears to be more and more a barrier as the species spreads southward. In time, of course, a small, more heat-tolerant race might become selected or evolved, or lower mortality might counterbalance the lower reproductive potential. Perhaps for the first time in the history of North American ornithology we have a good opportunity to watch the interaction of climatic and biotic factors on a species expanding its range, and moreover, a species which has been well-studied both in the field and in the laboratory. It is hoped that this paper will stimulate bird students in southeastern United States to record all possible details on the species. Absence or failure of the species in a given locality is just as important for the records as is the converse.

SUMMARY

1. In June, and July, 1950, the first nests of the House Wren known in Georgia were observed at Athens. One male and two females constructed three nests. The first nest found (nest No. 1) was believed to be a second nesting and contained four eggs all of which hatched and fledged. The other female had two broods, the first of which contained five young (two were collected) and the second contained five eggs of which only three hatched and fledged. All nests were located in metal fence posts within a one-half acre grove containing fenced enclosures for domestic animals. Only one nest, however, was well-shaded by the pecan trees. The male of the colony was collected and proved to be *Troglodytes aëdon baldwini;* it was identical with West Virginia specimens.

2. Since the House Wren was not known to nest south of Virginia and Kentucky prior to 1920 but has since appeared in many points of

North Carolina, upper South Carolina, and western Tennessee, it is clear that a well-marked southward invasion of the southeast by birds of mid-western stock (*baldwini*) is occurring. Progress has been most rapid in the Piedmont Region, east of the Appalachians, where Bewick's Wren is rare or absent as a breeding bird. The invasion resembles that of the Robin and the Blue-headed Vireo recently documented, in that it has occurred by "jumps"—groups of birds colonizing locally, often at some distance from the last known point of their southern range.

3. Analysis of climatic conditions and known physiological tolerances of the species leads to the conclusion that biotic rather than climatic factors limited the southern boundary of the range as it existed prior to 1920. However, since the amount of reproduction (as judged by the number of eggs laid and hatched) by the Athens colony was definitely decreased by high temperatures during the egg-laying periods, it is thought that climate, particularly maximum daily temperatures during the breeding season, will exert an increasingly important limiting effect as the species moves southward.

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Department of Biology, University of Georgia, Athens, Georgia, November 20, 1950.

TWENTY-SIXTH SUPPLEMENT TO THE AMERICAN ORNITHOLOGISTS' UNION CHECK-LIST OF NORTH AMERICAN BIRDS[1]

THE present supplement covers proposals for change in name or status, or for addition, that have been accepted by action of the Committee to the end of the year 1950. The Committee held sessions during the A.O.U. meetings in Minneapolis and St. Paul, and has conducted much additional business through the circulation of memoranda. The revision for the Fifth Edition of the Check-list is now well advanced into the final Order, the Passeriformes, though there is a considerable volume of work still ahead.

Committee
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12. *Fulmarus glacialis minor* (Kjaerbølling). SHORT-BILLED FULMAR. [86a.]. *Procellaria minor* Kjaerbølling, Danmarks Fugle, 1852, p. 324. (North Greenland.) Additional subspecies. Baffin Island, Davis Strait, and western and northern Greenland. See Salomonsen, Dansk Orn. For. Tidsskr., vol. 44, pt. 2, April, 1950, pp. 100–105; Birds of Greenland, pt. 1, 1950, pp. 40–41.

38. *Branta nigricans* again considered a species, distinct from *Branta bernicla*. Found breeding on Prince Patrick Island with *B. b. hrota*. See Handley, Wilson Bull., vol. 62, no. 3, 1950, pp. 128–132.

39. *Anser albifrons albifrons* (Scopoli) becomes *Anser albifrons frontalis* Baird, from *Anser frontalis* Baird, in Baird, Cassin and Lawrence, Rep. Expl. Surv. R. R. Pac., vol. 9, 1858, p. 762. (Selkirk Settlement and Fort Thorn = Fort Thorn, N. Mex.) See Todd, Condor, vol. 52, no. 2, March 15, 1950, pp. 63–68.

64. *Accipiter gentilis striatulus* (Ridgway) in part is synonymized with *A. g. atricapillus*, and in part becomes *Accipiter gentilis laingi* Taverner, from *Astur atricapillus laingi* Taverner, Condor, vol. 42, no. 3, May 15, 1940, p. 160. (Masset, Queen Charlotte Islands, British Columbia.) See Friedmann, U. S. Natl. Mus. Bull. 50, pt. 11, 1950, pp. 150, 162.

75. *Falco peregrinus calidus* Latham, becomes *Falco peregrinus harterti* Buturlin, Psov. i Ruzejn. Okhota, vol. 13, no. 7, 1907, p. 100. (Lower Kolyma.) See Friedmann, U. S. Natl. Mus. Bull. 50, pt. 11, 1950, p. 665; Stegmann, Journ. f. Orn., vol. 82, pt. 2, April, 1934, pp. 228–231.

[1] The Twenty-fifth Supplement was published in The Auk, vol. 67, no. 3, July, 1950, pp. 368–370.

115. The genus *Rhyacophilus* is united with *Tringa*, since the slight differences are not considered of generic value. The species of our list therefore will stand as follows: *Tringa glareola* Linnaeus.

118. *Erolia maritima* becomes *Erolia maritima maritima* through recognition of the following subspecies.

118. *Erolia maritima groenlandica* (Løvenskiold). GREENLAND PURPLE SANDPIPER. [235*e*.] *Calidris maritima groenlandica* Løvenskiold, Dansk Orn. For. Tidsskr., vol. 44, September, 1950, p. 166. (Godthaab, Greenland.) Additional subspecies. Greenland.

157. The genus *Oreopeleia* is united with *Geotrygon*, as the slight differences are not considered of generic value. See Wetmore, Proc. Biol. Soc. Washington, vol. 63, December 29, 1950, p. 173. The forms of our list therefore will stand as follows:

Genus Geotrygon Gosse

Geotrygon Gosse, Birds Jamaica, 1847, p. 316. Type, by subsequent designation, *Geotrygon sylvatica* Gosse = *Columbigallina versicolor* Lafresnaye (Reichenbach, 1852).

Geotrygon chrysia Bonaparte.

Geotrygon montana montana (Linnaeus).

191. The genus *Balanosphyra* is reduced to a subgenus of *Melanerpes*. See Peters, Check-list Birds of the World, vol. 6, 1948, pp. 157–159. The races in our list therefore will stand as follows:

Melanerpes formicivorus formicivorus (Swainson).

Melanerpes formicivorus bairdi Ridgway.

Melanerpes formicivorus martirensis (Grinnell and Swarth).

Melanerpes formicivorus angustifrons Baird.

205. *Myiarchus tuberculifer tresmariae* Nelson. TRES MARÍAS OLIVACEOUS FLYCATCHER. [455*b*]. *Myiarchus lawrencei tresmariae* Nelson, Proc. Biol. Soc. Washington, vol. 17, March 10, 1904, p. 49. (María Madre Island, Tres Marías Islands, México.) Additional form. Tres Marías Islands, west coast of Nayarit, México; casual in the Sierra Laguna, Baja California. See Phillips, Auk, vol. 66, no. 1, January, 1949, p. 92.

225. Genus *Cissilopha* Bonaparte, Consp. Gen. Av., vol. 1, 1850 (February 3, 1851), p. 380. Type, by monotypy, *Garrulus sanblasianus* Lafresnaye = *Pica san-blasiana* Lafresnaye.

Added for the following:

Cissilopha san-blasiana nelsoni Bangs and Penard. NORTHERN SAN BLAS JAY. [483.*1*.] *Cissilopha sanblasiana nelsoni* Bangs and Penard, Bull. Mus. Comp. Zoöl., vol. 63, June, 1919, p. 40. (Colima, México.) Nayarit to Colima, southwestern México; recorded near Tucson, Arizona. See Phillips, Condor, vol. 52, no. 2, March 15, 1950, p. 86.

234. *Parus inornatus murinus* (Ridgway), 1903, antedated by *Parus murinus* Brehm, 1855, takes the next available name, becoming *Parus inornatus affabilis* (Grinnell and Swarth), from *Baeolophus inornatus affabilis* Grinnell and Swarth, Univ. Calif. Publ. Zool., vol. 30, no. 5, September 16, 1926, p. 164. (Concepción, 6,000 feet altitude, Sierra San Pedro Mártir, Baja California.)

263. *Myadestes townsendi* becomes *Myadestes townsendi townsendi* because of recognition of an extralimital subspecies. See Moore, Proc. Biol. Soc. Washington, vol. 50, November 30, 1937, p. 201.

298. *Euthlypis lachrymosa tephra* Ridgway becomes *Euthlypis lachrymosa* (Bonaparte), since no subspecies are recognized. The reference for the name is *Basileuterus lachrymosa* Bonaparte, Consp. Gen. Av., vol. 1, 1850 (February 3, 1851), p. 314. (Lagunas, Oaxaca.) See van Rossem, Occ. Papers Mus. Zool. Louisiana State Univ. no. 21, 1945, p. 233.

308. *Cassidix mexicanus nelsoni* (Ridgway). SONORAN BOAT-TAILED GRACKLE. [513*c*.] *Scaphidurus major nelsoni* Ridgway, Proc. Washington Acad. Sci., vol. 3, April 15, 1901, p. 151. (Álamos, Sonora.) Additional form. Sonora. Recently recorded from several localities in southern Arizona.

322. *Pinicola enucleator eschatosus* Oberholser. NEWFOUNDLAND PINE GROSBEAK. [515*g*.] *Pinicola enucleator eschatosus* Oberholser, Proc. Biol. Soc. Wash., vol. 27, March 20, 1914, p. 51. (Harry's River, Newfoundland.) Additional form. Breeds from Newfoundland to Nova Scotia, northern Maine, and northern New Hampshire; south in winter to southern New England and New York; casually elsewhere. See Wetmore, Journ. Washington Acad. Sci., vol. 39, no. 7, July 15, 1949, pp. 245–247.

343. The first reference to the scientific name of the Eastern Bachman's Sparrow is *Fringilla bachmani* Audubon, Birds Amer., folio ed., vol. 2, 1833, plate 165. The following year, in Orn. Biogr., vol. 2, 1834, p. 366, the name was given as *Fringilla bachmanii*. The accepted form, from the earlier date, is *Aimophila aestivalis bachmani* (Audubon).

353. *Passerella iliaca zaboria* Oberholser. YUKON FOX SPARROW. [585 *p*.] *Passerella iliaca zaboria* Oberholser, Journ. Washington Acad. Sci., vol. 36, no. 11, November 15, 1946, p. 388. (Circle, Alaska.) Additional form. Breeding from Alaska and Hudson Bay south to Alberta and Manitoba; in winter to Texas, Louisiana, and Florida.

GENERAL NOTES

Range of the Ringed Penguin, *Pygoscelis antarctica*.—In the January, 1949, issue of 'The Auk,' Mr. Malcolm Davis draws attention to Peter I. Island as a new locality of the Ringed Penguin. As a member of the U. S. Navy Second Antarctic Development Project, 1947–1948, Mr. Davis landed at Framnes Head, Peter I. Island, on February 15, 1948, and found two specimens of the Ringed Penguin, which did not appear to have been breeding and were brought to The National Zoological Park in Washington, D. C.

However, as I wrote Mr. Davis some time ago, but after his note for 'The Auk' had been printed, the Ringed Penguin has been reported from Peter I. Island before, and in February, 1948, it was actually breeding there, but only a single pair.

The first landing at Peter I. Island was carried out during the second Norvegia expedition, on February 2, 1929, and the zoologist and scientific leader of the expedition, Dr. O. Olstad, has given a brief account of the birds of the island (Norsk Geogr. Tidsskr. 2, Oslo, 1929); he found the Adelie Penguin, *Pygoscelis adeliae*, breeding, and observed the Ringed Penguin. This information is repeated in a report of 1945 by the present author ('Antarctic and Sub-antarctic Birds' [Oslo], reviewed in The Auk, 64: 476–477).

The Norwegian Brategg expedition of 1947–1948 visited Peter I. Island from February 8 to 13, 1948, and missed the U. S. S. Edisto and Mr. Davis by two days only and less than 200 miles. On Framnes Head, I banded 51 Adelie Penguins (26 adults and 25 chicks) and four Ringed Penguins (2 adults and 2 chicks).

From this, and from additional specimens collected, and observations made during two days ashore, I estimate the number of Adelie Penguins as 18 or 20 pairs with young, Of the Ringed Penguin, a pair and two chicks were banded, but in addition at least one unmated adult was seen.

It was interesting to note that the Adelie chicks were full-grown and fully feathered, yet some of them still had some down adhering to the upper parts (head, neck, back, and flippers). The two Ringed Penguin chicks were only about half-grown, and still in their second down, gray or grayish brown.

Murphy ('Oceanic Birds of South America,' 1: 412–413) says ". . . chicks hatched about the end of the first week in January at the South Orkneys were beginning to show the chin-strap of their first contour plumage by February 11," and, as their rate of growth is more rapid than that of the nearest relatives, ". . . were thus quite as advanced as their cousins of the other species."

The Ringed Penguin chicks of Peter I. Island may have hatched about January 20, a rather late date for such a highly polar region.

As the two specimens captured by Mr. Davis were not banded, it is possible that one or two of the Ringed Penguins observed and banded by me may have lost the ring. But is it also possible that more than one unmated bird has been present; yet I never saw simultaneously more than three specimens ashore. At least it is to be hoped that one parent, if not both, remained for the upbringing of the young. The nest was situated amidst the major part of the Adelie rookery which consisted of three distinct groups, one of these consisting of two pairs, another of four, and the third comprising the rest.

To conclude, I may mention that the Ringed Penguin was observed at sea once only, at the ice-edge in position 66° 25′ S. lat., 89° 55′ W. long.—two birds on December 19, 1947.—HOLGER HOLGERSEN, *Stavanger Museum, Stavanger, Norway.*

Yellow-billed Tropic Bird, *Phaëthon lepturus catesbyi*, on the North Florida Coast.—Arthur H. Howell ('Florida Bird Life,' 1932: 81–82), records the occurrence of the Yellow-billed Tropic Bird in Florida as follows: Audubon, eight or ten birds seen at the Dry Tortugas, 1832; Maynard, a single bird seen near the Florida Keys, 1881; Brewster, a single specimen taken at Merritt's Island, 1886; Pennock, a single bird seen at St. Marks, 1919.

As far as is known by the writer this present specimen is the only one of this species taken on the north Florida Coast.

On September 7, 1950, this bird was picked up by Mrs. A. W. Sears on Ponte Vedra Beach, St. John's County, apparently exhausted by the hurricane of September 6. It was taken to her home where she set out food, but it would not eat. The next day she took it to the beach and released it, where it was picked up by Mr. Hutchinson I. Cone, Jr. who took it to his home and attempted to feed it. It refused food and died September 9.

Mr. Cone brought the specimen to me and I made a study skin of it. It was later identified as an immature Yellow-billed Tropic Bird by Dr. Pierce Brodkorb of the Department of Biology, University of Florida, Gainesville.

On September 9 the writer, accompanied by Messrs. S. A. Grimes and Wilbur Gary, went to Ponte Vedra Beach and to Jacksonville Beach where Mr. Grimes found a primary from a Yellow-billed Tropic bird—possible proof that other birds of this species had visited the north Florida Coast.—Reg. R. McKay, *Jacksonville Children's Museum, Jacksonville 4, Florida.*

The Pinnated Bittern, *Botaurus pinnatus*, in Paraguay.—*Botaurus pinnatus* (Wagler), the Pinnated Bittern, has a wide distribution in South America from Colombia, Venezuela, and Trinidad south to western Ecuador on the Pacific coast, and through central and eastern Brazil (Mato Grosso, Goiaz, Pernambuco, Baía, Rio de Janeiro, São Paulo) to Uruguay and the Province of Buenos Aires, Argentina. In the interior it has not been recorded to date in Bolivia, and it is reported from Paraguay for the second time in the present note. There are also two authentic records for Nicaragua, from San del Norte and the Río Menco, though the species has not been found elsewhere in Central America. The U. S. National Museum has one skin from near Orloff, in the Paraguayan Chaco, taken April 11, 1950, by O. O. Miller. The collector noted that the species was rare, but apparently it is known to the Indians since the name Pin-pin-ay is recorded on the label, together with an observation on the usual bittern habit of posing so that the bird is distinguished with difficulty from its background of rushes.—Alexander Wetmore, *Smithsonian Institution, Washington, 25 D. C.*

Some Observations on the Laysan Duck, *Anas wyvilliana laysanensis*.—On June 23, 1950, the MV Hugh M. Smith, fisheries research vessel of the Pacific Oceanic Fishery Investigations, U. S. Fish and Wildlife Service, stopped at Laysan Island during a voyage of research. The author, who was aboard the vessel as a collaborator of the Fish and Wildlife Service, went ashore to tag green turtles and observe reef fishes and sea birds. While engaged in these tasks, counts were made of the Laysan Duck.

Thirty-three Laysan Ducks were counted during the course of a walk about the central lagoon of Laysan Island, of which 26 were adults and seven were young. The young ducks were still downy and were observed in two small flocks of four and three birds, respectively, each behind an adult female.

Four of the birds counted were flushed out of the beach morning glory which thickly covers patches which are acres in extent; these birds only flushed when accidentally approached within four feet or less. The remainder of the birds counted were found along the shores of the lagoon and were passed without flushing, at least for any distance. These facts make it most unlikely that any of these ducks were counted more than once, and there may have been ducks in the beach morning glory that were not flushed. Hence, these counts of the ducks of Laysan are undoubtedly less, by an unknown amount, than the actual number of birds on the island.

At the present time the population of the Laysan Duck appears to be on the increase. Fisher (Bull. U. S. Fish Comm., 23 (pt. 3): 769–807, 1903) estimated the total population to be less than 100 birds at the time of his visit in May of 1902. Munro, ('Birds of Hawaii,' Tongg Publ. Co., Honolulu, 1944) gave the following estimates made by various observers:

Year	*Number of Ducks*	*Observer*
1911	6	Professor Dill
1925	20	Dr. Wetmore
1936	11	Mr. Coultas

The number observed during the visit of the MV Hugh M. Smith exceeds all previous estimates except that of Fisher. The apparent increase in the duck population, as indicated by these counts, may be due to the comparative infrequency of visits during the last decade and also to the restoration of the vegetative cover following the disappearance of rabbits from the island. The description and photographs of Laysan Island given by Fisher for 1902 would fit the conditions observed at the time of my visit, which was not the case for the other observers listed.

The Laysan Finch, *Telespiza flavissima*, is yet quite abundant. No examples of the Laysan Rail, *Porzanula palmeri*, were seen, however.—Vernon E. Brock, *Board of Agriculture and Forestry, Honolulu 1, T. H.*

Rat Snake Overpowers Red-shouldered Hawk, *Buteo lineatus*,—On the morning of December 3, 1950, Mr. J. M. Heiser, my son Stephen, his friend William Green, and I saw a Red-shouldered Hawk lying behind a small bush within the area of the San Jacinto Battlefield near Houston. It was on its back, its feathers ruffled, its wings half-extended and relaxed, its legs limp. The mouth and eyes were open; it was not struggling. Only on second glance did we see that a large snake was wrapped tightly about the hawk's neck. Holding the hawk's legs, I removed the snake. The thick of its body formed one loop about the bird's neck, and its tail region formed another. I had to exert considerable force to release the loops. When the hawk was free, it hung limp in my hand for a few seconds, and then started struggling. I released it, and it flew away, apparently not seriously injured. The snake proved to be a Lindheimer's Rat Snake, *Elaphe obsoleta lindheimeri*. It was just over four feet long and nearly two inches in diameter. We could find no injury on its body, and it was still full of energy. We released it, and after a few threatening gestures in our direction, it crawled away. I have no doubt that, without our intervention, the hawk would have been dead in a few more minutes. Since the Red-shouldered Hawk preys on snakes, and the Lindheimer's Rat Snake sometimes preys on birds, one wonders which animal was the aggressor in this encounter.—George G. Williams, *The Rice Institute, Houston, Texas.*

Aerial Feeding of Duck Hawk, *Falco p. anatum*.—During the summers of 1949 and 1950, the writer has had exceptional opportunities to observe the tremendous bat flights which issue from the largest bat cave in the United States, the Ney Cave,

Medina County, Texas (Edwards Plateau). Some 13 trips have been made there, and flights checked carefully. Other observers at Texas bat caves, whether interested in the bats themselves, or the caves which harbor them, have commented on the predation on these mammals by certain birds of prey Several of them mention the Duck Hawk. However, as far as the writer has been able to find, none refers to the habit of this superb falcon of occasionally feeding on the wing.

While many instances of predation were noted in 1949, such habit was not observed by the writer until 1950. The method of securing prey varies. At times, the falcon will dive headlong into the stream of bats in a spectacular stoop; again it may fly straight through the "living river," and emerge with a bat in the talons. Also, at times, it flies parallel to them, then swerves sideways, makes a "zoom" and reaches outward and forward with the talons, so seizing a bat. One was seen in early August to miss such a strike then, almost instantaneously, reach sideways with the right foot, and seize a bat.

In at least half a dozen instances during 1950, the falcon was seen to begin feeding on the bat at once. Reaching the foot forward and the head downward and back, it devoured the edible portions quickly, releasing the wings which fluttered downward. During this manoeuver the falcon's wings were at right angles to the body, and the bird was soaring. It was exactly the technique of the Swallow-tailed Kite, *Elanoides forficatus*, in aerial feeding.

Predation by such birds at Ney Cave has been recorded by D. G. Constantine "Great Bat Colonies Attract Predators" and K. E. Stager "Falcons Prey on Ney Cave Bats" (National Speleol. Soc., Washington, D. C., Bull. 10: 100, 98, April, 1948). The bat preyed upon is the Mexican Free-tailed Bat, *Tadarida mexicana*. The population of Ney Cave has been estimated at between 20 and 30 million bats. It seems rather obvious that raptorial predation on these animals at this locality is inconsequential, though regular. The writer has never witnessed aerial feeding of the Duck Hawk previously, though he has seen it make many kills.—ALEXANDER SPRUNT, JR., *National Audubon Society, Charleston 50, S. C.*

Food of the Peregrine Falcon, *Falco peregrinus*, in Interior Alaska.—On September 24, 1950, a Peregrine's aerie was discovered on some bluffs overhanging the Tanana River near the old town site of Chena, Alaska. A single, adult falcon, probably a male to judge by its small size, was seen to fly down the river and perch on one of the bluffs. Another trip was made to this site on September 30, and on subsequent days, but the Peregrine was not seen again, and it was assumed that the bird had migrated.

Investigation of the bluffs revealed a number of feeding shelves and scrapes that were well-covered with droppings, pellets, and the remains of prey. This seemed to indicate that a family of Peregrines had occupied the bluffs during the past summer, and in as much as the Indians living along the river are acquainted with a pair of Peregrines that has nested in past years on some bluffs about five miles farther down the river, this seems even more likely.

The remains lying about the bluffs were collected on October 1, and the data from these are presented in the accompanying table. Unfortunately it is not known how many Peregrines occupied the bluffs during the breeding season or how long the material had been accumulating below the aerie. The data do, however, give some interesting information on the relative use of various birds as food by the Peregrine Falcon.

Kill items included such things as dried wings and feet, dried heads, loose primary and secondary feathers, tail feathers, and breast feathers. Each kill item has been tabulated, but where two or more items appeared to belong to a single prey animal, these have been recorded as one individual.

SUMMARY OF PEREGRINE KILLS

Species	*Number kill items*	*Number individuals represented*	*Percent total prey*
Holboell's Grebe, *Colymbus grisegena* (?)	1	1	2.4
Green-winged Teal, *Anas carolinensis*	6	4	9.7
Buffle-head, *Bucephala albeola* (?)	1	1	2.4
Sparrow Hawk, *Falco sparverius*	1	1	2.4
Spruce Grouse, *Canachites canadensis*	1	1	2.4
Ruffed Grouse, *Bonasa umbellus*	1	1	2.4
Lesser Yellow-legs, *Totanus flavipes*	6	4	9.7
Gulls, *Larus* spp.	11	8	19.6
Hawk Owl, *Surnia ulula*	1	1	2.4
Northern Flicker, *Colaptes auratus*	1	1	2.4
Alaska Jay, *Perisoreus canadensis*	5	5	12.5
Hudsonian Chickadee, *Parus hudsonicus*	1	1	2.4
Gray-cheeked Thrush, *Hylocichla minima* (?)	1	1	2.4
Rusty Blackbird, *Euphagus carolinus*	1	1	2.4
Pine Grosbeak, *Pinicola enucleator*	1	1	2.4
Robin, *Turdus migratorius*	4	2	4.9
Unidentified passerines	9	7	17.0
TOTAL	52	41	100

In order that the figures represented in the table may have more meaning, the following generalizations are offered on the relative abundance in the Fairbanks area of the species listed in the table. These generalizations are based on personal observation but are not the result of any extensive or systematic counting technique. 1. The Green-winged Teal, *Anas carolinensis*, is the common nesting duck in this area. 2. Next to the Wilson's Snipe, *Capella gallinago*, which does not appear in the table, the Lesser Yellow-legs, *Totanus flavipes*, is the most common member of the Scolopacidae seen in the spring. 3. The Short-billed gull, *Larus canus*, and the Herring Gull, *Larus argentatus*, are both common migrants along the interior rivers. 4. The Alaska Jay, *Perisoreus canadensis fumifrons*, is the fourth most common resident passerine bird, being exceeded in numbers only by the Chickadees, *Parus* spp., the Pine Grosbeak, *Pinicola enucleator*, and the Redpolls, *Acanthis* spp., in ascending order. The Robin, *Turdus migratorius*, is the most common migratory passerine bird.

The rather high incidence of forest and woodland birds, species whose habitat preferences normally preclude most of them from the Peregrine's diet, which appears in this table may be due to the fact that the Tanana River provides an open hunting area nearly a mile wide where these bluffs are located. Any forest-inhabiting species attempting to fly from one side of the river to the other would be highly vulnerable to the hunting tactics of the Peregrine.—TOM CADE, *College, Alaska.*

Sora, *Porzana carolina*, in Connecticut in Midwinter.—On January 3, 1950, Mr. Allan Barker captured a Sora in a muskrat trap in Glastonbury, Hartford Co., Connecticut. According to Chandler S. Robbins of the U. S. Fish and Wildlife Service, at whose suggestion this note is written, this represents the second Connecti-

cut winter record for the Sora, and one of a very few winter records for New England as a whole.

Mr. Barker presented the bird to Miss Marjorie Crimmings who prepared it as a study skin and donated it to Cornell University. It was an adult male, apparently in excellent physical condition. The testes measured approximately 4 by 2 millimeters. The specimen is now No. 22392 in the Louis Agassiz Fuertes Memorial Collection at Cornell.—KENNETH C. PARKES, *Laboratory of Ornithology, Cornell University, Ithaca, New York.*

Courtship Feeding by the Purple Gallinule, *Porphyrula martinica*.—At a fishing camp on the St. Johns River, Brevard Co., Florida, three pairs of these Gallinules took from the hand offerings of bread and raw fish. They came to the door of the owner's cabin and sometimes entered it. A nest, about four rods from the door-yard, containing six eggs which hatched April 29 to May 1, 1950, was attended by one of the birds which brought bits of bread and fed it to the other. Mrs. M. M. Nice tells me this may be the first recorded instance of this kind for this species. She writes, "Lack (1940) says that it has been reported for *Gallinula chloropus*."—E. R. FORD, *Newaygo, Michigan.*

American Woodcock, *Philohela minor*, Nesting in South Carolina.—Although the American Woodcock is recorded as a permanent resident of South Carolina, there are only six previous records of its eggs being observed in this state (Sprunt and Chamberlain, South Carolina Bird Life, 1950: 221).

After having been told by one of my patients that he had flushed several Woodcocks in a swamp ten miles east of Lake City in Florence County, South Carolina, while quail hunting, I went to this swamp on February 16, 1950, to search for their nest. I flushed two birds. One was apparently feeding; the other was flushed from its nest. The four slightly incubated eggs were in a depression in the dead leaves at the foot of several black gum saplings about 20 feet from the water's edge. The ground where the eggs were placed was only about six inches above the water level of the swamp.

On February 25, 1950, I collected two more sets of eggs in a small swamp 15 miles southeast of Florence, Florence County, South Carolina. One set was found under the branches of a recently felled pine tree on fairly high ground 50 or 60 feet from the water's edge in the swamp. The bird was flushed while feeding 30 feet from its nest. The four slightly incubated eggs were cold. The other set was in a small, bush-covered mound of earth completely surrounded by water in the center of the swamp. The bird was flushed from its nest, and the four eggs were well along in incubation.—WILLIAM J. JENKINS, *Olanta, South Carolina.*

A Spring Record of the Woodcock, *Philohela minor*, in Kansas.—On March 5, 1949, I was making observations at the nest of a Great Horned Owl, *Bubo virginianus*, on the north wall of the Museum of Natural History at the University of Kansas, Douglas County, Lawrence, Kansas. At 9:55 p. m. the adult female left the nest after feeding the two owlets bits of rabbit meat. At 10:15 p. m. she returned to the nest ledge with a freshly decapitated American Woodcock. This specimen was checked with study skins in the museum collection. So far as is known this is the first spring record for Kansas. Long stated in his 'Check-List of Kansas Birds' (Trans. Kansas Acad. Sci., 43: 442, 1940) that the Woodcock was formerly a rare summer resident, now an occasional migrant. However, all records have been in the fall.—ROGER O. OLMSTED, *818 Alabama Street, Lawrence, Kansas.*

A Set of Twelve Eggs of the Woodcock, *Philohela minor*.—In common with other members of the family, a set of eggs of the Woodcock almost always numbers four. Sets of five are rare and sets of three are not common, although found once in a while. The following occurrence is, therefore, of unusual interest.

On April 30, 1938, Paul Bryan of the Tennessee Valley Authority found a nest of this bird at the Wheeler Reservoir, near Decatur, Alabama, that contained 12 eggs. When the report was received with other distribution and migration data, I naturally assumed that an error had been made and wrote Mr. Bryan to that effect. He replied that "The nest of twelve Woodcock eggs is correct. I saw the bird on the nest, flushed her off and counted the eggs. There could be a possibility of several [birds] laying in the same nest although I have never heard of it. I made a complete check of the nest and contents. The eggs were all Woodcock eggs and there were twelve in the nest."

As Mr. Bryan states, this set could have been the product of three females laying in the same nest, but even if this explanation is accepted, the record is most exceptional.—FREDERICK C. LINCOLN, *Fish and Wildlife Service, Washington, D. C.*

Greater Yellow-legs, *Totanus melanoleucus*, Swimming.—On October 18, 13 Greater Yellow-legs were seen feeding along the edge of a small fresh-water pond on the edge of the salt marsh near Cape May Court House, New Jersey. My companion and I advanced cautiously, and the birds, becoming uneasy, waded out into the pond. Instead of taking flight, as we expected, they continued wading until they floated and then gathered into a close group and continued swimming gently towards the center of the pond. They swam easily, with the fore-part low and the stern high, and kept up a musical gabbling as they progressed. After they had gone about 50 yards and had reached the center of the pond they suddenly sprang into flight and made off, calling the usual tri-syllabic note.

Earlier in the day we had watched a single bird swim across a ten-foot channel in the marsh while chasing small fish, and I have a note of an exactly similar occurrence last year on October 12.

Bent (U. S. Nat. Mus. Bull. 142: 328, 1927) quotes J. T. Nichols' reference to this not infrequent swimming of the Greater Yellow-legs. It is to be expected that shorebirds can swim; what is surprising is that they do it so seldom.—J. D'ARCY NORTHWOOD, *270 North Fullerton Avenue, Montclair, N. J.*

Wilson's Phalarope, *Steganopus tricolor*, a New Record for the West Indies.—On September 25, 1949, an example of Wilson's Phalarope, was collected by Mr. François Hayot at Petit-Bourg, Martinique, French West Indies. Identification of the specimen has been confirmed at the American Museum of Natural History, New York, to the collection of which it has been added.

This constitutes a new record for the West Indies, a somewhat remarkable fact because Wilson's Phalarope is a regular migrant to South America and was originally described from Paraguay. The species, unlike the two other phalaropes, is primarily a bird of inland waters rather than of the ocean, and pelagic records in either the Atlantic or the Pacific are extremely rare.

The Martinique specimen is a young bird, wholly comparable in plumage and measurements with others of the same season of the year. Its youthful character was confirmed by examination of the gonads. Its stomach was full of insects in a state of digestion that made identification impossible. The terrain in which it was collected was a bare, flat stretch of land separated from the sea by a mangrove swamp and showing only a few tufts of sedge among pools of rainwater.

Possibly the presence of Wilson's Phalarope at Martinique may be explained by the violent atmospheric disturbance that prevailed over the Caribbean area during September, 1949. Between September 20 and 23 there were similar depressions and anticyclones over the southern United States and the Gulf of Mexico, and on the 24th of the month a hurricane swept over the Tampico district with violent repercussions as far east as the Lesser Antilles.

From July to November, Martinique lies on the flyway of many migrant shore birds, including *Totanus melanoleucus, T. flavipes, Tringa solitaria, Numenius phaeopus, Catoptrophorus semipalmatus, Micropalama himantopus, Ereunetes pusillus* and *E. maurii, Erolia melanotos, E. fuscicollis, E. minutilla, Pluvialis dominicus,* and *Squatarola squatarola*. Under the circumstances it is likely that further observation in the Lesser Antilles may show that the species here recorded is a less uncommon migrant than has been believed in the past.—Reverend Father Pinchon, *M. Bon-Saint-Come, Martinique.*

The Pomarine Jaeger, *Stercorarius pomarinus*, in South Carolina.—Heretofore, there has been but one record for the occurrence of *Stercorarius pomarinus* in South Carolina—a sight record by Allan R. Phillips, off Charleston, November 4, 1943. On October 28, 1950, while fishing in Lake Moultrie, Santee-Cooper, Berkeley County, S. C., Mr. Ben Scott Whaley of Charleston secured a male Pomarine Jaeger with a boat paddle! It was making an attack on a Laughing Gull, *Larus atricilla*, and had knocked the latter out of the air into the water three times when Mr. Whaley came up to it in an outboard skiff. The jaeger was so intent upon its victim that it was itself killed in the above mentioned manner. The specimen was presented to the Charleston Museum. Two others were seen the same afternoon.

This record, aside from constituting the first actual specimen of the species for the state, is the more remarkable on account of the location. The writer has seen jaegers but twice from South Carolina beaches, though they occur regularly offshore. Lake Moultrie is a huge, impounded body of water, created for hydroelectric power, about 30 miles in from the coast. Its presence attracts numerous gulls, and one supposes that these jaegers must have followed such birds inland. The writer is indebted to Mr. Whaley for the privilege of recording this important capture and observation.—Alexander Sprunt, Jr., *The Crescent, Charleston 50, S. C.*

Nests of the Barn Owl, *Tyto a. pratincola*, and the Red Crossbill, *Loxia curvirostra*, in Essex County, Massachusetts.—The Barn Owl has nested regularly for many years on Martha's Vineyard, off the southeast coast, but there are few records of breeding birds for the mainland of Massachusetts. Several for the Springfield area, Cambridge (1942–1944), Concord and Pittsfield (each in 1945) are the only printed records found for this century. In Essex County the bird has been considered an accidental visitor, with eight records prior to 1949; three of these are substantiated by specimens in the Peabody Museum in Salem. These were collected over a wide span of years: Lynn, 1862; Danvers, 1900; and Ipswich, 1931. On May 9, 1949, Mr. and Mrs. Daniel Poor, Jr., of the latter township found an owl sitting on four eggs in their barn; this was identified by Mrs. Lionel Shepherd as a Barn Owl. On June 7, 28 days later, one egg hatched. The adult continued to sit on the remaining eggs until they were removed on June 24, after they had been incubated for more than six weeks. Two proved to be empty, the third was infertile. The single young was photographed and banded on July 9; on July 20 it left the rafter near the nest and was not again seen until July 23 when it was found, well-feathered out, in a "nest" of old automobile tires piled on the floor below. It was noted intermittently

until the first week of September; fresh owl pellets were found during the remainder of the month.

Although this barn is in constant use and the doors are usually open, the Barn Owls again nested here in 1950. Three young hatched from the clutch of four eggs and the young were again banded.

Flocks of Red Crossbills appear in Massachusetts with some regularity; there are more than 60 published records for the decade 1940–1950. Nesting records are quite otherwise—the Marblehead nest of 1917 being the only one known for the mainland of this state in the twentieth century (Wm. Brewster, Auk, 35: 225, 1918).

During the winter of 1949–50 from one to four of these wanderers were seen at intervals on Andrews Point, Cape Ann. A pair was watched on March 3, 5, and 13 for a total of five hours as they fed on the seeds of the pitch pine, *Pinus rigida*. They called softly and continuously, though the hard, dry *pip-pip* was never heard; the male at times sang briefly. On March 17 Mr. Martin Curtler of Rockport and I saw the female carrying nesting material. With the male in close attendance and singing softly, we watched her working on a half-built nest about 30 feet up in a pitch pine. The nest was saddled on a branch three feet from the tip, where the foliage was dense, and only a short distance from the upper windows of a summer cottage. The female carried an eight-inch willow twig from a nearby tree and worked it into the nest; she also broke off and used dead twigs from a white spruce, *Picea alba*, planted in a neighboring yard. The area contains a number of summer homes, then vacant, with adjoining groves of pitch pines.

On March 15 Miss Ann McCarthy of Beverly saw the pair of Crossbills with Chickadees, *Parus atricapillus*, and Red-breasted Nuthatches, *Sitta canadensis*. The Red Crossbills later left the flock and went to the nesting tree where the male was seen to pick up pine needles and present them to the female, repeating this performance three times. The birds kept up a constant low chattering while working. On March 24 the nest appeared to be finished, but there were no Crossbills in the vicinity. However on April 6, the owner of this property, Mrs. Harold S. Dole, saw the female sitting on the nest as the tree was whipped by a wild gale. Later in the day it had fallen, and she recovered the nest, intact but empty, from the road below. There on April 7, Mr. Curtler found some egg fragments which with the nest were placed in the Peabody Museum.

The nest is composed principally of fine grasses and weed stalks; around the outer rim there are a few small twigs from three to five inches long, most of them from the spruce mentioned above. Three feathers are visible, the largest a white chicken feather worked into the base. While allowance should doubtless be made because of the fall from the nesting tree and subsequent handling, the measurements as taken are: outside diameter 4.75 inches; inside diameter 2.0 by 2.4 inches; the somewhat oval bowl slightly more than an inch deep; total height was 2.0 inches.—DOROTHY E. SNYDER, *Peabody Museum, Salem, Mass.*

Saw-whet Owl, *Aegolius a. acadicus*, Nesting in Illinois.—To date there is but one known record of the nesting of the Saw-whet Owl in Illinois. Benjamin Gault's 'Check List of Birds of Illinois' records one nest in Marion County, Illinois, in 1890. For several years I have wondered whether Saw-whet Owls nested in the vicinity of Quincy, Illinois.

On April 28, three boys were hiking through a heavy willow woods bordering the Mississippi River, when a small brown bird flew from a broken willow. Looking up, they discovered four fuzzy little owls slightly larger than a domestic chicken egg. One bird fell into the river and was not retrieved, but the other three were captured,

then fed on fishing worms, beetles, and raw meat until they were old enough to fly.

The soft chocolate underparts, the small size, the dark bill, the well defined white "V" from above the eyes, and the lack of ear tufts identified them as Saw-whets. When they were able to fly they were released.

I feel this is a legitimate second nesting record in Illinois for this owl.—T. E. MUSSELMAN, *Quincy, Illinois.*

A Substitute Name for a Thrush, *Turdus*, of the West Indies.—The name *Turdus nigrirostris* Lawrence (Ann. New York Acad. Sci., 1: 146 [in reprint, 147], June, 1878) proves to be preoccupied by *Turdus nigrirostris* Karelín (Trudy Sankt-Peterburgskago Obshchestva Estestvoispytatelei, 6: 288, 1875). For the bird of Saint Vincent, I propose *Turdus fumigatus* **bondi**, new name, in honor of James Bond, the well-known authority on West Indian ornithology.

Karelín's name has been ignored by such authors as Hartert and Steinbacher, but is not a *nomen nudum;* the accompanying brief description may be translated from the Russian as follows: "Similar to the Siberian [thrush], but distinguished by the lack of a white eye-brow. Arrives in flocks late in the autumn." Its type locality is "the territory of the Cossacks of the Ural," which, on modern maps, appears as the West Kazakhstan Province of the so-called Kazakh Soviet Socialist Republic.

The "Siberian thrush" of the Russians is *Turdus sibiricus* Pallas, 1776, known to non-Russian ornithologists as a species breeding from Japan to central Siberia in two races, each of which has a very conspicuous white supercilium in the adult. One must wonder whether *Turdus nigrirostris* Karelín represents a little-known, but valid, resident form of western Siberia, or merely an exceptional specimen of one of the familiar races.—H. G. DEIGNAN, *Smithsonian Institution, Washington, D. C.*

The Discovery of Sprague's Pipit, *Anthus spragueii*.—"The first specimen of this truly interesting Lark was procured by Mr. Sprague, another of my companions, who shot it on the 19th of June, 1843, near Fort Union, Upper Missouri." So said Audubon in 'The Birds of America' (Vol. 7: 334, 1844) where the bird that he called *Alauda Spragueii*, after his artist, Isaac Sprague, is described. That statement is generally accepted as fact and it is perpetuated in Bent's 'Life Histories of North American Wagtails, etc.' (1950). There are, however, three records that show it to be not literally true. One of these appears in Audubon's journal of his Missouri River expedition, published in 'Audubon and His Journals,' edited by Maria R. Audubon (1897) with notes by Elliott Coues, where, on page 41 of Volume 2, under date of June 19, 1843, we read, "Harris and Bell have returned, and, to my delight and utter astonishment, have brought two new birds: one a Lark, small and beautiful," etc. To this Coues's footnote is: "This is the first intimation we have of the discovery of the Missouri Titlark, which Audubon dedicated to Mr. Sprague under the name of *Alauda spragueii* . . . It is now well known as *Anthus* (*Neocorys*) *spraguei*." Just before this the journal had said, "Sprague has been drawing all day."

Although the journal as printed does not state it specifically (there is indication of an omission), Audubon must have decided at once to name the new "Lark" for Sprague because he had already named a sparrow and a vireo for Harris and Bell respectively, for on the next day Harris and Bell are out again and he is hoping they will bring more specimens of "Sprague's Lark." On June 22 Audubon and his companions heard the song of "the little new Lark that I have named after Sprague" but had not been able to discover its nest. On the 24th, however, the nest was found, and very appropriately by Sprague himself, who took the female and her five eggs. Thus Sprague had more than a merely honorary association with his "Lark,"

the bird we now know as Sprague's Pipit, though if we are to give credence to Audubon's journal, written at the time of its discovery, he was not the original discoverer.

Fortunately there are two other authorities which corroborate Audubon's journal record. One is Isaac Sprague's own diary for 1843, the manuscript of which has been presented to the Boston Athenaeum by his grandson Isaac Sprague, of Wellesley, Massachusetts, who, as well as the Athenaeum, has given me permission to quote from it. This diary says under date of June 19, 1843, "Messrs. Harris and Bell went out shooting and brought in . . . a small species of titlark which is probably new." And again, under date of June 23: "While out I watched one of the new titlarks for nearly an hour—as it sailed over my head high in the air—singing its simple notes at intervals of about 10 seconds, the song itself occupying about 5 seconds. While singing they remain nearly still moving their wings in a rapid manner like a little hawk, and in the intervals between they sweep around in an undulating manner closing the wings to the body like the goldfinch. 3 of these titlarks killed today." Sprague's last mention of his "titlark" is under date of June 24 and records the finding of the nest as follows: "Found the nest of the titlark and shot the female as she rose from it. It was built on the ground, in a small cavity so that the top of the nest was even with the surface and slightly shaded by a small tuft of grass. The eggs five in number are pale brown thickly spotted with darker."

Besides corroborating the account in Audubon's journal of the discovery of Sprague's Pipit, Sprague's own account, here, I believe, for the first time published, is interesting in itself, as I think the reader will agree.

The third piece of corroborative evidence is brought to my attention by the editor of 'The Auk.' It is in Phillips B. Street's paper 'The Edward Harris Collection of Birds' (Wilson Bull., 60: 167–84, 1948), which I had read at the time of its publication but had forgotten. There Harris's own diary is quoted as follows, under date of June 19, 1843: "As we returned home Bell and I fired together and shot a small bird which proves to be an entirely new Anthus or Titlark," and under date of June 24, "In the afternoon Bell and Mr. Audubon rode down to the Fort again and on their way killed more of the new Larks. Sprague was out and killed another, and what is of more consequence discovered its nest with 5 eggs," etc.

It is interesting to note that while Audubon spoke of the new bird as a Lark, both Sprague and Harris gave it the proper designation of Titlark, except that Harris, perhaps following Audubon, calls it a Lark in the second entry quoted.

Now the question arises whether science owes it to Audubon to follow his own statement in a book formally published by him, and keep on saying that Sprague's Pipit was named for its discoverer, or whether we should stick to what appears to be the cold fact as testified to by Audubon himself in his journal, by one of the actual discoverers, and by the man for whom the bird was named. Perhaps it is an ethical question more than a scientific one since there is no question of nomenclature or type locality involved. After all, a decision either way would not rock the foundations of either science or morals. Perhaps the problem has been faced before.—FRANCIS H. ALLEN, *9 Francis Ave, Cambridge, Massachusetts.*

Further Evidence on the Refractory Period in the Reproductive Cycle of the Golden-crowned Sparrow, *Zonotrichia coronata*.— In 1948 the results of three years of experimentation with light stimulation of Golden-crowned Sparrows were reported (Miller, Journ. Exper. Zool., 109: 1–11) which showed that a refractory period exists in this species during which artificial illumination is not able to induce recrudescence of the testes. This period occurs in the autumn from the time of

arrival on the wintering grounds in late September until about November 5. Gradual increases in length of the light-day, roughly approximating spring conditions, begun before November failed to initiate recrudescence, and a high light dosage of 15.5 hours a day attained by that time and maintained constantly throughout the winter and spring also failed to stimulate gonadal growth, at least up to April 1. These findings indicated that rhythmic glandular activity is present as an inherent attribute, but that it is an imperfect timing device determining alternate refractory and potentially active periods within the limits of which photostimulation must fix the annual breeding period with greater precision. A later experiment (Miller, Science, 109: 546, 1949) conducted during the refractory period showed that refractoriness probably is a property of the pituitary gland rather than the testes since gonadotropic hormone administered then did result in enlargement of the testes.

These findings are not completely in accord with those of other workers conducting related experiments and observations on different species of birds. Burger (Journ. Exper. Zool., 105: 259–267, 1947) found in Starlings that when a certain light dosage threshold (12.5 hours) is exceeded, recrudescence will take place, although self-induction will not occur below this threshold. Bartholomew's work (Bull. Mus. Comp. Zool., 101: 433–476, 1949) on the English Sparrow shows that males will come into breeding condition in the post-refractory period in winter on days as short as 10 hours and with relatively low light intensity. Burger (Wilson Bull., 61: 211–230, 1949) subsequently reported that refractoriness in Starlings can be prolonged if continuous high-level lighting is given before, during, and after the breeding condition. He suggests (p. 223) that such induced prolongation is the explanation for the Golden-crowned Sparrow's failure to respond to sustained light dosage from November to April. There may be something similar about these prolonged failures to respond in the two species, yet there is also a possibly important difference. The Starlings were treated continually until the testes increased and then involuted, which situation presumably forced an especially extended rest and refractoriness of the pituitary-gonad mechanism, whereas in the Golden-crowned Sparrow the light treatment was started during a normally attained refractory period and resulted in a preservation or maintenance of this preexisting condition.

Blanchard and Erickson (Univ. Calif. Publ. Zool., 47: 255–318, 1949) working with the White-crowned Sparrow, *Zonotrichia leucophrys*, without experimentation, have shown that Leydig cells, which probably are involved in the production of gonadal hormones, appear in the testis in winter when the day length is close to normal minimum. They contend that the appearance of even a few of these cells marks the initiation of recrudescence and that this takes place without benefit of increased light stimulation. It occurs to mind that the appearance of a few Leydig cells may indeed be the first histologic sign of the passing of refractoriness—perhaps the result of a slight production of gonadotropins by the pituitary and an indication of potentiality for proceeding to higher production. Whether or not the recrudescence in the White-crown would proceed to the later, more grossly manifest, stages without light stimulation can, of course, not be determined without experimentation, some of which is now in progress. Marshall's (Nature, 166: 1034–1035, 1950) recent description of the disappearance of Leydig cells and their subsequent regeneration following the autumnal inactive period may likewise be regarded as a possible sign of the condition of the pituitary; these cells are not necessarily themselves the seat of refractoriness.

These several questions and the partly conflicting results obtained from different passerine species has made it desirable to repeat and extend the testing of refractori-

ness in Golden-crowned Sparrows. It should be realized that the discrepancies in results may derive from species differences. In the fall of 1949 a group of experimental birds was started which included 10 male Golden-crowns. Rather than begin light treatment gradually as before, a sudden change to a constant 15.5-hour day from a normal of about 11.5 hours was made on October 24. This was done in order to determine whether refractoriness would show up in the face of this sudden dosage that is greater than any probable threshold level. The light was held at 15.5 hours until May 24 when the last birds were autopsied. This date was two to four weeks after normal spring migratory departure and after controls had reached stages 4 and 5 of testis recrudescence (see Blanchard and Erickson, *op. cit.*). Gonads of nine birds were saved in Bouin's fluid and were sectioned to ascertain histologic detail and particularly the presence and number of Leydig cells.

The results (table 1) with respect to size of the testes are indicated by volumes of the left testis taken at dates from December 17, 1949, to May 24, 1950; these should be compared with the data in the table on page six of the earlier report (Miller, 1948, *op. cit.*). One control additional to those previously reported (1948) had a

TABLE 1

Age	*Date autopsied*	*Duration of treatment*	*Volume of left testis in mm.*^{3}
?	Dec. 14	51	1.06
ad.	Dec. 14	51	.76
ad.	Jan. 29	97	1.28
im.	Feb. 2	101	.40
ad.	Feb. 2	101	1.27
ad.	Mar. 26	153	1.28
	(gonad not sectioned)		
ad.	Apr. 22	180	.63
?	Apr. 22	180	.70
im.	May 24	212	.68
?	May 24	212	.34

testis of 5.34 mm.^{3} on April 23, 1950. The figures for size if plotted as before (see fig. 1, Miller, 1948) all lie along the line for the birds of Experiment 1, which group originally demonstrated the state of refractoriness. The line is essentially a straight one from December until late May.

The following conclusions may be drawn from the results: (1) the existence of the refractory period of the Golden-crowned Sparrow in the fall is confirmed by the experiment of 1949–50; (2) the refractoriness is not overcome by an immediate sudden shift from normal autumnal day length to 15.5 hours of light; (3) the failure to respond subsequently to sustained high-level light dosage that has been initiated in the normal refractory period is confirmed and the persistence of the failure extends at least to May 24; and (4) although eventually the pituitary-gonad mechanism might come into activity under this light regime, such an event would not permit a normal successful breeding season to be carried out in late May and June.

Sections of the testes of nine experimental birds showed an essentially uniform histologic condition which agrees in all particulars with stage 2 of Blanchard and Erickson (*op. cit.*: 266). There is no significant tubular enlargement, no thinning of the sheath of the testis, no increase in spermatogonia, and no sign of development of primary spermatocytes. The critical feature of this stage according to them is the

appearance of Leydig cells in small numbers in the intertubular spaces; these cells are absent in stage 1. Leydig cells are difficult to find in stage 2 but usually one to six per section can be located in my material. Whether or not these cells are completely absent or at least unrecognizable at any time in the Golden-crowned Sparrow I can not at present determine. The control bird whose testes were sectioned showed that on April 23 there were abundant Leydig cells, enlarged tubules, and many primary spermatocytes in synapsis. If we assume by analogy with the closely related White-crown that the appearance of a few Leydig cells is a first sign of recrudescence before any tubular growth or progress in meiosis, the significant fact derived from the experiment is that under the light regime used the testis remains in stage 2 without other histologic progress from December to May. Further development is not inherent or automatic in this period without appropriate light conditions.—ALDEN H. MILLER, *Museum of Vertebrate Zoology, Berkeley, California.*

NOTES AND NEWS

IT IS with pleasure that we announce the formation of the A. O. U. Illustrations Committee, composed of David E. Davis, Cleveland P. Grant, Robert A. McCabe, Roger Tory Peterson, Charles W. Schwartz, and Milton B. Trautman, Chairman. The Committee has been functioning for some time, and the selection of the painting for the present frontispiece was one of its first jobs.

One of the wishes of the Committee is to prepare and to publish in 'The Auk' several series of life history photographs, with descriptive legends. Providing photographs and funds are available, each series might consist of two to four, or even more, plates. Another aspect of the Committee's rôle is selection of colored plates. It has processed the one mentioned above and is working on several others. However, as regards both the black and white pictures and the paintings or color-slides to be used, it takes time for all matters to be satisfactorily settled and proofs checked by everyone concerned. The Committee is, therefore, desirous of learning of any such illustrative material that is available for use in 'The Auk'; in this way the pictures will be on hand and in shape to use as funds and space permit.

President Van Tyne has appointed the following Committee on the Nomination of Associates: Leonard Wing, *Chairman*. Aaron Moore Bagg, *Vice-Chairman*. Gordon Alexander, Clark S. Beardslee, Betty Carnes, C. Russell Mason, Robert T. Orr, William F. Rapp, Jr., Chandler S. Robbins, Ernest S. Booth, and William J. Beecher.

Mr. T. M. Shortt is to be congratulated on his excellent painting of juvenile pipits, and we want especially to thank him for permitting its use in 'The Auk.' It is just this sort of illustrative material we desire—the kind that points up little-known aspects of bird structure, behavior, ecology, etc., or that pictures birds not widely known or illustrated.

Dr. T. S. Palmer notes that three ornithological centennials occur in 1951—January 27, the death of J. J. Audubon; July 5, the birth of William Brewster; and August 20, the birth of Ruthven Deane.

Marcel Henri Felix de Contreras, Corresponding Fellow, died in Ixelles, Belgium, on December 28, 1949.

The Membership List of the American Ornithologists' Union appears in this issue. Despite the attention to details, there may be errors or omissions. Please call them to our attention.

The Wilson Ornithological Club held its thirty-second annual meeting on April 27 and 28, 1951, at the Davenport Public Museum, Davenport, Iowa. More than 300 members and guests attended.

Harrison B. Tordoff of the University of Kansas was named Editor of 'The Wilson Bulletin' to succeed George M. Sutton whose resignation takes effect with the end of the present volume (December, 1951). Leonard C. Brecher, Louisville, Ky., was elected Treasurer succeeding James H. Olsen, and William W. H. Gunn, Toronto, Ont., was elected to the Executive Council succeeding Richard Pough. Maurice Graham Brooks, President, and other officers were re-elected.

Gatlinburg, Tennessee, at the entrance of Great Smoky Mountains National Park, was the location selected for the thirty-third annual meeting to be held on April 26 and 27, 1952.

The Cooper Ornithological Club held its twenty-second annual meeting April 20 to April 22, 1951, at Asilomar Conference Grounds, Pacific Grove, California.

Dr. Frank A. Pitelka was elected President of the Board of Governors, Dr. Robert Orr, Vice-President, and Dr. Charles G. Sibley, Secretary. Officers of the corporation are: John R. Pemberton, President; Dr. Jean M. Linsdale and Ed N. Harrison, Vice-Presidents; and Kenneth E. Stager, Secretary.

The sixty-ninth stated meeting of the American Ornithologists' Union will be held October 8 through 13 (Monday through Friday), 1951, at Montreal, Province of Quebec, Canada. Hosts for the meeting will be the Province of Quebec Society for the Protection of Birds. Headquarters will be the Mount Royal Hotel where the business sessions will convene on Monday and the annual banquet will take place on Wednesday evening. Papers sessions will be held on Tuesday at McGill University, on Wednesday at the University of Montreal, and on Thursday at the Botanical Gardens. On Friday there will be field trips to the Heron Island Sanctuary and St. Helen's Island. Mr. G. H. Montgomery, Jr., 4689 Westmount Avenue, Westmount, P. Q., is chairman of the Local Committee on Arrangements.

Titles of papers and of motion pictures for presentation at the meeting must be in the Secretary's hands not later than September 1. The title of each paper must be accompanied by a brief abstract of the paper's contents and a statement concerning the time desired for delivery and the kind of projection facilities needed, if any. The title of each motion picture must be accompanied by a brief description of the film's subject matter and a statement concerning the total footage and the time desired for projection and commentary.

Papers and motion pictures submitted for presentation will be reviewed by the Committee on Communications. Abstracts of papers chosen for presentation will be mimeographed and made available at the meeting. It is important, therefore, that all abstracts be carefully prepared by the authors.

Handbook of North American Birds

For some time the Council and members of the American Ornithologists' Union have been discussing the desirability of preparing a concise handbook on North American birds. A committee under the chairmanship of Dr. Ernst Mayr was appointed by President Robert Cushman Murphy to consider the preparation of such a book. That committee's excellent report was adopted with enthusiasm by the Council, and in October, 1950, the Council voted to ask Dr. Ralph S. Palmer of the New York State Museum at Albany to become editor-in-chief of the handbook. Fortunately Dr. Palmer received the generous backing of Director Carl E. Guthe of his Museum and has agreed to accept the responsibility for this great undertaking.

The Handbook of North American Birds, sponsored by the American Ornithologists' Union, will be a broadly cooperative undertaking. Dr. Palmer will ask for extensive help from a number of specially qualified individuals and for smaller though essential contributions from a great many others among our membership. Details will be announced by Dr. Palmer from time to time in these pages. The present brief announcement can only outline the project as it is now visualized by Dr. Palmer and the Council.

The objective is to present with reasonable completeness, but in telegraphic style, our knowledge of each of the more than 600 species occurring in the A. O. U. Check-list area (omitting Baja California).

Five volumes of not over 550 pages each are planned, and these will be published as completed. In general, the handbook will emphasize habits and ecology. There will be an introductory section on each family, and under each species it is now planned to include the following topics: plumage description, field characters, voice, range, migration, reproduction, habitat, habits, food, and a select bibliography. Subspecies will be treated only briefly.

As a first step, it would be very helpful if persons who have compiled bibliographies on particular species or subjects (such as bird weights, incubation periods, longevity) would inform Dr. Palmer and volunteer the use of such material. Dr. Palmer may be addressed at New York State Museum, Albany 1, New York.

RECENT LITERATURE

Genetics of the Fowl.—F. B. Hutt. (McGraw-Hill Co., New York), pp. xi + 590, 140 figs., 72 tables, 1949. Price, $6.50.—Although primarily a technical book for the poultry geneticist, the book contains much to commend it to the ornithologist and general biologist. For the first time there is an up-to-date, complete, and authoritative compilation of the genetics of the domestic chicken with occasional references to other fowl. A valuable feature of the book for the non-geneticist is that it includes material concerning the fowl which is to a large extent scattered in periodicals which are not generally available.

Written in a rather engaging style, the book starts with an introduction to the phylogeny and classification of birds, particularly with respect to the origins of the domestic fowl. A short chapter on cytology and gametogenesis presents in a clear and selective manner the more important facets of what is known about these subjects in the fowl. The known genetic variations are treated in chapters headed: Variations in the Skeleton, Structural Variations in the Skin, Variations in the Plumage, Variations in the Color of the Skin, Variations in the Color of the Plumage, Lethal Genes and Miscellaneous Characters, Variations in Body Size, Egg Production, Variations in Eggs, Genetic Resistance to Disease, Genetic Aspects of Reproduction and Linkage. A final chapter, Genetics in Practice, contains technical information for the practical breeder.

Possibly the most important thing about the book from the standpoint of the ornithologist is the fact that a great deal of genetic information has been compiled relative to a single species of bird. The relative dearth of similar information about other species is at once apparent. It would be highly desirable to have such information for other species, although certainly this information is much easier to obtain in the domestic fowl than in, for example, the California Condor!

In view of some taxonomic difficulties with avian material, it is interesting to note the widespread effects upon the skeletal system of single genes such as "Creeper" or "Rumplessness," and the genetic basis for many color backgrounds and patterns.

Other highly commendable points are the thorough bibliographies at the end of each chapter, the careful organization of subject material, a welcome list of symbols of genes for the fowl, a good glossary, and subject and author indices. The format is up to the usual high standards of the McGraw-Hill Co., and the photographs and other illustrations are for the most part excellent.—James B. Kitzmiller.

The Edge Effect of the Lesser Vegetation of Certain Adirondack Forest Types with Particular Reference to Deer and Grouse.—F. B. Barick. Roosevelt Wildl. Bull., 9 (1): 1–146, 37 tables, 20 figs., 1 map, 1950.—This study is a graphical and mathematical analysis of wildlife habitat potentialities of ten forest types as compared with the edges between these types. The vegetation was analyzed in a series of plots (0.1 acre for trees, 0.001 acre for shrubs, 0.00025 acre for herbs) extending from the interior of one type, across its edge or ecotone, and into an adjacent different type. The relative density and area covered by each plant-species were recorded for each different type of forest-edge, and their values as food and cover for wildlife evaluated. In general, most of the tree-cover consisted of spruce, balsam, yellow birch, red maple, beech, and sugar maple; shrubs chiefly of witch hobble; and herbs of wood fern, wood sorrel, and dwarf dogwood. Edges were composed mainly of the constituents of the two adjacent vegetation types with the amount of tree-, shrub-, and herb-cover varying in a reciprocal relation to each other.

The average width of all edges could be easily traversed by animals of low cruising radius, such as the Ruffed Grouse. The edges most nearly fulfilling the requirements of Ruffed Grouse and white-tailed deer were those between spruce flat, mixed hardwood, and northern hardwood, but even these edges lacked substantial fall and winter fruits for grouse. However, both deer and grouse showed a greater preference for the center of the spruce flat type than for its edges towards either mixed hardwood or northern hardwood. The warning is given "that we have to some extent overplayed the entire concept of edge effect, often indiscriminately ascribing to it unlimited powers of increasing all forms of wildlife." A new concept is developed, *threshold of edge preference*, which is attained when it is possible to detect the smallest amount of preference for the edge between two types as opposed to the centers of these types, the edge being computed as one-fourth of the average width of the vegetation-type.—S. CHARLES KENDEIGH.

De Vliegkunst in Het Dierenrijk.—E. J. SLIJPER. (E. J. Brill, Leiden), pp. viii + 178, 144 figs., 11 pls., 1950.—This is a well-documented compilation of information on animal flight, particularly that of birds. There is a brief historical account of "bird machines," constructed during man's early attempts to fly, followed by an exposition of certain pertinent aeronautical principles—flow around various types of air foils, effects of streamlining, lift, drag, slotting, porosity, wing-loading, tip vortex, aspect ratio, camber, etc. These factors in flight are illustrated throughout the book by excellent line drawings and diagrams which emphasize the structures and mechanics involved.

Dr. J. M. Burgers has aided the author in the presentation of the aeronautical data. The principles are then applied to hovering, soaring, and flapping flight of animals, with a detailed analysis of the kinetics of the parts of the avian wing.

There is a good bibliography of 10 pages, but literature since 1946 is not included for, as is stated in the Introduction, the manuscript was virtually complete at that time. The indexing is sufficient. Compared to Storer ('The Flight of Birds,' 1948) the present book is less popular in style, more complete, and more detailed but, being in Dutch, it will be somewhat less usable to English-speaking students.—H. I. FISHER.

A Bibliography of the Published Writings of Charles Johnson Maynard (1845–1929).—CHARLES FOSTER BATCHELDER. Journ. Soc. for the Biblio. of Nat. Hist. (Care of British Museum, Natural History), 2, pt. 7: 227–260. Jan. 4, 1951. Price 15 s.—C. J. Maynard was not only a prolific writer and an important naturalist of his period but was also the editor, artist, engraver, typesetter, printer, and publisher for many of his own writings. Therefore, a full and carefully prepared analysis of his long and very complicated bibliography has been urgently needed. It is very fortunate for us that Charles F. Batchelder, America's senior practicing ornithologist, has been able to complete and publish this excellent bibliography on which he worked for so many years.

Maynard's nearly 300 publications (1868–1929) are of particular interest to the student of birds, but he wrote about many other classes of animals and during the latter part of his career he became increasingly interested in mollusca (especially *Strophia* and *Strophiops*, under which names he described some 241 new forms). He described many new birds from Florida, the Bahamas, and British Columbia, and one (the Ipswich Sparrow) from Massachusetts. He also proposed many new generic subdivisions for American warblers. All new names are indexed by Batchelder.—JOSSELYN VAN TYNE.

There's Always Adventure, the Story of a Naturalist's Wife.—GRACE E. BARSTOW MURPHY. (Harper and Brothers, New York), pp. xvi + 299, 45 photos.—As the wife of Robert Cushman Murphy of New York's American Museum of Natural History, Grace Murphy gives intimate sidelights into the lives, the joys, and the tribulations, of a naturalist's wife and children, not only when they are left alone to endure loneliness and added responsibilities, but also when colleagues join them to add zest and interest to the family group.

Mrs. Murphy is an ardent advocate, one might say crusader, for travel by the family with the naturalist husband and father. On page 48 we find "Sometimes at home in different groups of people I see untraveled families of the naturalists. It has often seemed to me that a gap exists. The effect of the man's wide experience is both written on his face and comes out in his talk . . . Those wives who rise above the gap, filling in with interests and accomplishments of their own, face the chance that each of the married pair may grow too far apart." She firmly believes, and states often, that field work together now and then brings the husband and wife closer to each other and gives the wife a clearer insight into her naturalist-husband's work. This may be said to be the continuing theme of this book.

The author takes us traveling by proxy to Peru, Chile, Venezuela, and Ecuador, giving us vivid word pictures, not by a casual tourist, but by one keenly interested in the lives and emotions of all living things surrounding her. Mrs. Murphy writes of visits to Europe and across the continental United States in a manner less spirited and imaginative, perhaps because they are familiar scenes revisited rather than new territory giving fresh impressions. However, she amply makes up for this by her later colorful description of a recent visit to the Snares Islands in the subantarctic waters south of New Zealand.

Throughout her life, Grace Murphy has integrated marriage, home responsibilities, love of travel, and interest in her husband's scientific career. This she has ably depicted in her book, and it is enjoyable; it should be read by all "ornithology families." It will give them a more hearty appreciation of the adventure of living.—MILDRED L. FISHER.

Birds from Nepal, 1947–1949. S. DILLON RIPLEY. Journ. Bombay Nat. Hist. Soc., 49 (3): 355–417, 1 col. pl., 2 black-and-white pls., 1 map, 1950.—An annotated list of 331 species and subspecies collected, and 50 positively observed, by the author in the course of two recent expeditions, during which western, central, and eastern Nepal were visited. In an introduction (pp. 355-363), it is shown that "67 % of the endemic Himalayan axis forms collected in which two subspecies occur in the country, have a division between the forms in the eastern half of Nepal." Correlated with this is the fact that nine of the species taken are presumably found only in extreme eastern Nepal. The break between eastern and western Himalayan subspecies appears in the vicinity of the Arun Kosi River valley, which runs nearly north and south slightly east of the 87th parallel. Since the river is apparently geologically too recent to act as a barrier, it is suggested that the isohyet at the 87th parallel is responsible; east of this isohyet the annual rainfall is about 75 inches, west of it only 50 inches.

Another climatic correlation with speciation is found at the 80th parallel, where there is a decided change in the annual temperature range, although the annual rainfall of 50 inches remains the same.

It is noted that climatic changes cannot be marked by straight north-south lines, but that the lines would run roughly in a northwest-southeast direction. In western Nepal, the distributions of races follow this general pattern accurately.

The author shows that the destruction of forests and intensive agriculture of a shifting nature is rapidly altering the face of the country and creating new artificial geographical barriers, and that jungle-haunting birds of the mid-montane zone seem doomed to extirpation over large areas.

He has in some cases been misled in nomenclature by Stuart Baker; an example is offered by his treatment of *Malacocincla abbotti* as conspecific with *M. sepiaria*, despite the fact that these two are sympatric in many races throughout Malaysia.

The colored plate by Walter A. Weber has earlier appeared in the 'National Geographic Magazine'; on it are figured *Acanthoptila nipalensis*, *Kitta f. flavirostris*, *Garrulax rufogularis grosvenori*, and *Carpodacus n. nipalensis*.—H. G. DEIGNAN.

Letters on the Ornithology of Buenos Ayres.—W. H. HUDSON. Edited by David R. Dewar. (Cornell University Press, Ithaca), xv + 93 pp., 1951. Price, $2.75.—These early letters bear the unmistakable imprint of Hudson's literary talents just as his later literary works show the insight of a keen naturalist. Yet paradoxically, the young scientist who wrote the letters and the mature author of "Green Mansions" and "Far Away and Long Ago" seem like two totally different people. Hudson's later life in England as a writer and ardent protector of bird-life is in sharp contrast with his earlier years as a hunter and collector of birds. Even in the books in which he described the pampas in vivid detail, he seemed loath to present the facts and details of his own life there.

Anyone who has visited Latin America can imagine the extent and force of the impact of Victorian England on a young man raised in the freedom of the pampas. That Hudson adopted a British way of life with its attendant ideals and viewpoints lends plausibility to his desire to forget some of the aspects of his earlier life; and it is only through early letters such as these that we can get a glimpse of Hudson in the days when his chief interest was ornithology. The glimpse is of an enthusiastic young collector, sitting down to write in a refined hand, though with very poor spelling, about the habits of the birds around his home and not afraid to lock horns with such an eminent scientist as Darwin on the habits of the Carpintero.

The 12 letters which comprise this volume were written between December, 1869, and September, 1870. They were edited by P. L. Sclater and published in a somewhat condensed form in the 'Proceedings of the Zoological Society of London' in 1870 and 1871. The originals of seven of the letters have been preserved in the library of the Zoological Society and are now published as written. The remaining five are presented as published in the "Proceedings." The introduction includes two short letters from Hudson to Sclater. These are largely concerned with Hudson's bird collections upon which Sclater reported in 1869, but one letter refers to Hudson's having collected for the Smithsonian Institution. Dewar fails to mention that the Smithsonian still has preserved six of Hudson's letters and a photograph of Hudson taken in Buenos Aires. [All of one letter and parts of others have been published in the 'Saturday Review of Literature' (30, No. 15: 15–17, April 12, 1947) by Edwin Way Teale and R. Gordon Wasson.] The 12 letters are carefully annotated and the changes and footnotes made by Sclater in the "Proceedings" are appended. There is also an index which includes natural history references. From a literary and biographical point of view, the letters appear to be well edited, but even ornithologists will have to refer to "Birds of La Plata" to learn the identity of the Terúterú (= *Belonopterus*) and other birds for which only vernacular names are given, as well as for many birds listed by obsolete scientific names such as *Otus brachyotus* (= *Asio flammeus*).

Aside from their literary and biographical value, these letters are important in that they are perhaps Hudson's only available on-the-spot writing on the birds of the Argentine. For this reason it is interesting to compare them with the species accounts in his "Argentine Ornithology" and "Birds of La Plata" which were written years later in England.

The book is attractively printed and bound. In view of the marked difference between the careful hand in which these letters are written and the scrawl which Hudson used in his later years, this volume would have been considerably enhanced by a facsimile of at least part of one of the letters.—ROBERT W. STORER.

Where to Find Birds in Minnesota—A Guide to 62 Birding Areas, Parks, and Sanctuaries.—KENNETH D. MORRISON and JOSEPHINE D. HERZ. (Webb Publ. Co., St. Paul), 122 pp., maps, line cuts, 1950. Price, $1.50.—For each area, information is given on the best way to get there, terrain, best vantage points for observation, restrictions, hazards, and birds to be found. There is an index to localities, contributors, and common names of birds.—H. I. F.

Museum Pictorial.—Number 1 of this journal was published by the Denver Museum of Natural History on February 1, 1951. It is proposed to issue subsequent numbers from time to time, perhaps four each year.

Each number will have from 32 to 96 pages and will concern itself with a single subject. The present one contains a narrative account of Alfred M. Bailey's photographic experiences during 40 years in many lands, and is titled "Nature Photography with Miniature Cameras." It is illustrated with 35 photographs six by eight inches in size (many of birds), and they are excellent. Subjects tentatively scheduled for the next few numbers include: The Story of Pueblo Pottery; Nature Photography with the High Speed Flash; Fossil Mammals; and The Laysan and Black-footed Albatrosses.

Museum Pictorial is printed by offset in a most satisfactory manner. Each number will sell for $0.50, but the first five numbers may be obtained for $1.50 by writing to the Publications Department, Denver Museum of Natural History, City Park, Denver 6, Colorado.—H. I. F.

ABDULALI, HUMAYUN. 1950. Occurrence of the Chestnut-bellied Nuthatch (*Sitta castaneiventris castaneiventris*) in Sind—a correction. Journ. Bombay Nat. Hist. Soc., **49** (2): 303–304.—Should be removed from the list of the birds of Sind.

ABDULALI, HUMAYUN. 1950. On the Blue-tailed Bee-eater (*Merops superciliosus javanicus* Horsf.) in Bombay. Journ. Bombay Nat. Hist. Soc., **49** (2): 307.—First record of this bird for the Bombay area.

ACHARYA, HARI NARAYAN G. 1950. Occurrence of the Cinereous Vulture (*Aegypius monachus* Linnaeus) at Ahmedabad, North Gujarat. Journ. Bombay Nat. Hist. Soc., **49** (2): 307–309.

ALEXANDER, H. G. 1950. Kentish Plovers [*Leucopolius alexandrinus* (Linn.)] at Bombay. Journ. Bombay Nat. Hist. Soc., **49** (2): 311.

ALEXANDER, H. G. 1950. Large Grey Babbler attacking metal hub-cap of wheel of car. Journ. Bombay Nat. Hist. Soc., **49** (3): 550.—A note on *Argya malcolmi*.

ALI, SÁLIM, S. B. SETNA, AND H. SANTAPAU [Editors]. 1950. The Snow Goose (*Anser hyperboreus* Pallas) in Kashmir—an addition to the avifauna of India. Journ. Bombay Nat. Hist. Soc., **49** (2): 311–312.

AMADON, DEAN. 1950. Australian mud nest builders. Emu, **50** (2): 123–127.—Tentatively proposes to define the family Grallinidae to include *Grallina*, *Pomare-*

opsis, Corcorax, and *Struthidea;* remarks on the described races of *Grallina cyanoleuca, Struthidea cinerea,* and *Corcorax melanorhamphos.*

ASH, JOHN. 1951. The effect of a snow-storm on breeding birds. Brit. Birds, **44** (2): 57–59.

AUSTIN, OLIVER L. 1951. Group adherence in the Common Tern. Bird-Banding, **22** (1): 1–15.—From 1929 through 1948, 213,019 *Sterna hirundo* have been banded in Cape Cod colonies. There have been 31,867 returns on the breeding grounds and 292 recoveries in the winter quarters. These colonies "form a distinct, self-perpetuating group" on the breeding grounds. Group adherence also functions in winter quarters.

BARBOUR, ROGER W. 1950. Growth and feather development of Towhee nestlings. Amer. Midl. Nat., **44** (3): 742–749, 4 pls.—Day to day account of feather development and weight. Includes only the seven days in the nest for an average of about 10 birds.

BATES, R. S. P. 1950. The lower Sind Valley, and some further observations on bird photography. Journ. Bombay Nat. Hist. Soc., **49** (2): 178–187, 4 pls.—Miscellaneous notes, mainly on nesting and behavior of a variety of birds in the Vale of Kashmir, accompanied by excellent photographs of five species.

BELLROSE, FRANK C. 1950. Mississippi Flyway problems, projects, and prospects. Trans. 15th N. Amer. Wildl. Conf., 1950: 123–132.—Habitat of breeding, wintering, and refuge grounds; hunter management.

BENSON, C. W. 1951. Some breeding notes from Nyasaland. Bull. Brit. Orn. Club, **71** (1): 5–8.—Notes on 19 species.

BENTHALL, E. C., AND L. A. CRAVEN. 1950. Geese and duck on the Chilka Lake, Orissa. Journ. Bombay Nat. Hist. Soc., **49** (2): 312–313.

BENTON, MARJORIE AND ALLEN. 1950. Color choice in the food of the White-breasted Nuthatch. Feathers, **12** (12): 89–96.—Inconclusive, but shows that birds learn to use all colored food after a short time and that weight of individual is also an important factor.

BIAGGI, VIRGILIO, JR. 1950. Studies in the life history of the Puerto Rican Honey Creeper *Coereba flaveola portoricensis* (Bryant). Abstr. of Doctoral Diss. (Ohio State Univ. Press), No. **60**: 33–39, 3 tables.

BISWAS, BISWAMOY. 1950. On the shrike *Lanius tephronotus* (Vigors), with remarks on the *erythronotus* and *tricolor* groups of *Lanius schach* Linne, and their hybrids. Journ. Bombay Nat. Hist. Soc., **49** (3): 444–455, 1 map.—"Evidence is given of the fact that both *L. tephronotus* and *L. schach* breed in Kumaon and Garhwal, and that they do not intergrade. The question of type-locality of *L. tephronotus* is also discussed . . . An account of each subspecies of *L. tephronotus* and of the *erythronotus* and the *tricolor* groups of *L. schach* is given mainly in relation to distinctive characters, measurements, material examined, moult, breeding and range. It is shown with the help of a comprehensive hybrid index that *L. schach erythronotus* and *L. s. tricolor* hybridize in a vast area . . . , and that *Collurio nigriceps* Franklin is nothing but one such intermediate bird" [author's synopsis].—H. G. D.

BISWAS, BISWAMOY. 1951. Revisions of Indian birds. Amer. Mus. Novit., no. **1500**, 12 pp.—The Indian blossom-headed parakeets grouped under the name *Psittacula cyanocephala* prove to belong to two species. None of the earlier names applies to the second of these species which Biswas names *P. roseata* with type locality as Gunjong, n. Cachar, Assam. He also names a race *P. roseata juneae*—type locality, Arakan, Burma. Included also is a revision of the woodpecker,

Dendrocopos mahrattensis, with the new races *D. m. pallescens* from Lucknow, India, and *D. m. koelzi* from Aripo, n. w. Ceylon.—D. Amadon.

BOASE, HENRY. 1951. Sheld-Duck on the Tay Estuary. Brit. Birds, **44** (3): 73–83.—Counts of *Tadorna tadorna* from 1934 to 1950; data for brood size and fledging periods; dates for molt; and fluctuations in size of breeding populations. Sheld-ducks do not breed until their third summer.—M. M. N.

BÖSIGER, E. 1950. Vergleichende untersuchungen über die Brustmuskulature von Huhn, Wachtel und Star. Acad. Anat., **10** (4): 385–429.—The development and adult conditions of m. pectoralis thoracicus in the Domestic Hen, Quail, and Starling are compared. In the first two the development proceeds direct without a marked pre-juvenile phase which is, however, present in the Starling.

There are characteristic differences between the three species in rate of development, diameter of muscle fiber, distribution of nuclei, and blood supply of the flight muscles. The muscle fiber size was reduced by immobilization in a small series of Starlings. The pectoral muscle of the Quail, *Coturnix coturnix*, proved to be a specially suitable material for the study of red and white muscle fibers. English summary.—D. E. Davis.

BRAAKSMA, SJ., AND M. F. MORZER BRUYNS. 1950. Overzicht van de broedkolonies van de Blauwe Reiger, *Ardea cinerea* L., in Nederland in 1949. Ardea, **38** (3/4): 135–162, 1 pl., 12 tables, 2 maps.—Results of a census by questionnaires show a 44 % decrease in numbers in last 15 years, due primarily to inundations during war, deforestation in and near marshes, drainage, pollution, and persecution by man.

BROUN, MAURICE. 1951. Hawks and the weather. Atlantic Nat., **6** (3): 105–112, 15 maps.—Correlation of hawk flights along ridges with pressure areas, wind, and precipitation.

BROWN, A. GRAHAM. 1950. The birds of "Turkeith" Victoria. Emu, **50** (2): 114–122.

CHAPIN, JAMES P., AND DEAN AMADON. 1950. The Roseate Pelicans of Africa. Ostrich, **21**: 15–18.—The Roseate Pelican, *P. onocrotalus*, probably has no races. Recent usage of the name *roseus* for the species long called *Pelecanus philippensis* is unjustified.

CHISHOLM, A. H. 1950. Birds introduced into Australia. Emu, **50** (2): 97–100.—Chiefly additions and corrections to Tarr's "The distribution of foreign birds in Australia." Emu, **49** (3): 189–198.

CHITTLEBOROUGH, R. G., AND E. H. M. EALEY. 1950. Bird-ringing at Heard Island. Emu, **50** (2), 102–104.—List of the Procellariiform birds banded by the authors as members of the Australian National Antarctic Research Expedition.

CHRISTENSEN, GLEN C. 1950. A brief summary on the Chukar Partridge [*Alectoris graeca*] in Nevada, U. S. America. Journ. Bombay Nat. Hist. Soc., **49** (2): 309–310.

CLAY, THERESA. 1950. A preliminary survey of the distribution of the Mallophaga ('feather lice') on the class Aves (Birds). Journ. Bombay Nat. Hist. Soc., **49** (3): 430–443, 2 pls., 3 figs.—In addition to the subject matter suggested by title, the author shows where the distribution of the Mallophaga may throw light on the phylogenetic relationships of certain bird groups, at the same time pointing out certain pitfalls into which too great enthusiasm may lead the interpreter. The Mallophaga have a host-wise, not geographical, distribution, and an attempt is made for the first time to demonstrate such distribution graphically.—H. G. Deignan.

CONDON, H. T. 1951. Variation in the Brown Hawk. **Emu, 50 (3): 152–174, pls. 15–18.**—The question of the geographical races of *Falco berigora* Vigors and Horsfield is complicated by the existence of two color phases with all sorts of variations between the extremes. The views of recent authors have ranged from the radical ones of Mathews who recognized six races in Australia to those of Amadon who recognized but two. For the present revision the author has assembled a large series from the Australian Museum, Sydney, the South Australian Museum, the National Museum, Melbourne, and the Western Australian Museum, Perth, and is led to the conclusion that the most important character that is geographically variable is size. His studies have led him definitely to recognize five races from Australia (and tentatively a sixth race) whose ranges are outlined and characters given together with several tables of measurements.

For many years the hawks of this species have been universally placed in the monotypic genus *Ieracidea* Gould. Mr. Condon believes that there are no good reasons for continuing this usage since "osteologically it conforms to Falco," and throughout his paper consistently uses *Falco* for the generic name of the species.—J. L. Peters.

COWLES, RAYMOND B., AND WILLIAM R. DAWSON. 1951. A cooling mechanism of the Texas Nighthawk. Condor, 53 (1): 19–22, 2 figs.—Expansion and fluttering of the gular area to facilitate evaporation.

CREUTZ, GERHARD. 1950. Beringungsergebnisse an Lachmöven einiger sächsischer und benachbarter Brutkolonien. Orn. Abh., 8: 3–8, 1 pl.

CUNNINGHAM, J. M. 1951. Bird ringing in New Zealand. **Emu, 50 (3): 189–196.**—A brief account of bird banding in New Zealand together with the "rules of the ringing scheme of the Ornithological Society of New Zealand" and samples of forms for keeping records.

CUTCLIFFE, A. S. 1951. Notes on the breeding habits of the Swift. Brit. Birds, 44 (2): 47–56.—In 29 nestings of *Apus apus* 58 eggs were laid, of which 36 (62%) hatched and 29 young (50%) were fledged. Seventeen eggs were ejected by the parents in inclement weather during the six years; only twice did the birds attempt a second brood. Five chicks died in bad weather. Fledging took 37–54 days.—M. M. N.

DARLING, F. FRASER. 1951. The ecological approach to the social sciences. Amer. Scientist, 39 (2): 244–254, 1 fig.—Concerns itself primarily with the ecology of human beings—the West Highland people—but in a very readable fashion illustrates the need for proper ecological studies as a basis for all other work.

DARNTON, IRIS. 1951. The Broadbilled Roller—*Eurystomus orientalis laetior* Sharp [*sic*], in Ceylon. Spolia Zeylanica, 26 (1): 19–20.—The collection of a breeding pair at Maha Oya represents the rediscovery of a form known from Ceylon by only about a dozen records, all made prior to 1879.

DAVIS, MALCOLM. 1951. Carrier pigeons in the polar regions. Nat. Hist., 60 (3): 141–142, 1 fig., 1 photo.

DE GRAAF, C. 1950. De nachtvluchten van de Gierzwaluw, *Apus a. apus* (L.). Ardea, 38 (3/4): 165–178, 1 table.—Crepuscular flights begin about the third week in May; bad weather halts these flights. Number of birds in flights increases when juveniles appear. Adults roost in nest from arrival in spring until juveniles leave; neither adults or juveniles return to the nest once the juveniles leave it. These swifts cannot enter the nest in the dark, and hence evening crepuscular flights involve night-long flights.—H. I. F.

DEIGNAN, H. G. 1951. A new race of the Hawk-owl, *Ninox scutulata*, from the Philippines. Proc. Biol. Soc. Wash., **64**: 41–42.—*Ninox scutulata randi* (Catagán, from the base of Mount Malindang, Misamis Province, Mindanao Island).

DELACOUR, JEAN, AND CHARLES VAURIE. 1950. Les Mésanges Charbonnières (Révision de l'espèce *Parus major*). Oiseau, **20** (2): 91–121, 1 fig.—Recognizes 33 forms in two "main groups."

DELACOUR, JEAN. 1951. The Lesser Graybirds (*Coracina*) of Asia and Malaysia. Amer. Mus. Novit., No. **1497**, 15 pp.—A taxonomic review of the difficult cuckoo-shrikes formerly placed in the genus *Volvocivora*. Most of the forms are illustrated by photographs of skins. *Coracina polioptera jabouillei* a new subspecies from Pleiku, Kontoum Prov., Annam.—D. Amadon.

DELACOUR, JEAN, AND DEAN AMADON. 1951. The systematic position of Picathartes. Ibis, **93** (1): 60–62.—The aberrant genus *Picathartes* currently placed in the Corvidae is transferred to the Timaliinae (as defined by Delacour—Oiseau, 16: 7–36, 1946) and a separate "tribe," Picathartinae, created for its reception.—J. L. P.

DHARMAKUMARSINHJI, K. S. 1950. The Lesser Florican [*Sypheotides indica* (Miller)]: Its courtship display, behavior, and habits. Journ. Bombay Nat. Hist. Soc., **49** (2): 201–216, 1 pl., 2 figs., 2 tables.—"This paper contains descriptions of the male florican's courtship display (as newly seen) in presence of the female, mating, the method of snaring florican with decoys, the male's aggressive behavior towards a male decoy, and some useful information as regards migration, and the influence of weather upon the species in its breeding habitat" [author's synopsis]. In addition, much other life history material is brought together from the author's observations and those of others on this species of bustard.—H. G. D.

ELDER, NELL B. 1951. Can the Nene [*Branta sandvicensis*] come back? Aud. Mag., **53** (1): 24–30, 4 photos.—Popular review of the story of this rare goose.

ENGLAND, M. D. 1951. Studies of some species rarely photographed. XXIX. The Brambling. Brit. Birds, **44** (1): 14.—Seven very fine plates of nesting *Fringilla montifringilla*.

ETCHÉCOPAR, R. -D. 1950. Notes sur le Coucou [*Cuculus canorus*] en Hollande. Oiseau, **20** (2): 148–152.—Egg coloration as an adaptation for the parasitic mode.

FISHER, HARVEY I. 1951. The avifauna of Niihau Island, Hawaiian Archipelago. Condor, **53** (1): 31–42, 5 figs. including map.—In the history of the island located 150 miles northwest of Honolulu all native birds were eliminated. Notes are given on relative abundance, dates of introduction, distribution on the island, ecologic niche occupied, and natural history of the 45 species representing the present avifauna.

FOSTER, JOHN, AND CHRISTINA GODFREY. 1950. A study of the British Willow-Tit [*Parus atricapillus kleinschmidti*]. Brit. Birds, **43** (11): 351–361, 1 map.—Behavior, territory, food, nesting, incubation, and development of young.

FOSTER, R. J., R. L. BAXTER, AND P. A. J. BALL. 1951. A visit to Grímsey (Iceland) July–August 1949. Ibis, **93** (1): 53–59.—The authors' special object in visiting Grímsey was for the purpose of investigating the differences in the breeding habits of Brünnich's and Common murres, but a general survey of the number of species and individuals of breeding birds was also conducted. The results of the survey are here summarized and compared with the reports of ornithologists who have previously visited Grímsey. Few of the species found breeding showed any change in status except that the small colony of Dovekies has decreased in

size and the site of the Gannet colony was destroyed by a rock fall in 1947. The Common Snipe was found breeding there for the first time.—J. L. P.

GABRIELSON, IRA N., AND FREDERICK C. LINCOLN. 1951. A new race of ptarmigan from Alaska. Proc. Biol. Soc. Wash., **64**: 63–64.—*Lagopus mutus yunaskensis* (Yunaska Island, Aleutian Islands).

GIBB, JOHN. 1951. The birds of the Maltese Islands. Ibis, **93** (1): 109–127, 1 fig. (map).—An account of the islands and their birds based on the author's observations from August, 1941, to July, 1945, together with comparisons between the present status of the various resident and migrant species compared with earlier published accounts.—J. L. P.

GOODGE, WILLIAM. 1951. Variation in skeletal measurements of the Common Murre [*Uria aalge*]. Condor, **53** (2): 99–100.—Measurements and statistical evaluation of large sample of bones recovered from Indian middens on southeast Farallon Island.

GRANT, C. H. B., AND C. W. MACKWORTH-PRAED. 1951. Notes on eastern African birds. Bull. Brit. Orn. Club, **70** (9): 61–62.—*Seicercus ruficapillus mbololo* Van Someren = *S. r. minulla* (Reichenow); *Eremomela scotops kikuyuensis* Van Someren = *E. s. occipitalis* Fischer and Reichenow; *Seicercus umbrovirens chyulu* Van Someren = *S. u. mackenziana* (Sharpe).—J. L. P.

HAGEN, YNGVAR. 1950. Hvorledes en på marken sittende rudge (*Scolopax rusticola* L.) gir seg til kjenne for artsfeller som trekker over skogen. Vår Fågelvärld, **9** (4): 195–199, 1 fig. English summary.—The Woodcock on the ground may attract a flying member of the opposite sex by fanning out the rectrices, ventral surface up. The bright spots thus exposed reflect a great deal of light.

HAMILTON, J. E. 1951. The breeding place of *Pachyptila belcheri* Mathews. Ibis, **93** (1): 139–140.—Supports Murphy's surmise that the birds breed among the Jason Islands in the northwestern part of the Falkland Group. The author found them in fair numbers on Grand Jason, although they are not known from other islands of that group. A second breeding site in the Falklands is New Island where they nest in "very great numbers."—J. L. P.

HARPER, HAROLD T., GEORGE METCALFE, AND JOHN F. DAVIS. 1949. Upland game cooperative hunting areas. Calif. Fish and Game, **36** (4): 404–432, 28 tables, 2 photos, 6 figs.—Hunting statistics on game-farm and wild pheasants.

HARTFORD BIRD STUDY CLUB. 1951. Check List of the Birds seen in the vicinity of Hartford, Connecticut. (Hartford Bird Study Club, Hartford, Conn.), 19 pp. Price, $0.50.

HAZELHOFF, E. H. 1951. Structure and function of the lungs of birds. Poultry Sci., **30** (1): 3–10.—Translation of articles published in 1943; critical review of theories of function of avian lung and air sacs; analysis of air flow through lung and air sacs.

HERVEY, A. C. C. 1951. Black-headed Gull dropping and catching object in bill. Brit. Birds, **44** (1): 69–70.—On Oct. 28 a *Larus ridibundus* was seen to drop and catch a bivalve mollusc about a dozen times, apparently in play.—M. M. N.

HINDWOOD, K. A. 1950. The Upland Plover, or Bartram's Sandpiper, in Australia. Emu, **50** (2): 91–96, 1 pl.—Concludes that specimen 8563 in the Australian Museum is the actual bird taken near Sydney in 1848, and figured by Gould in 1867, and to date constitutes the only valid record of *Bartramia longicauda* for Australia.

HINDWOOD, K. A. 1951. Bird/insect relationships: with particular reference to a beetle (*Platydema pascoei*) inhabiting the nests of finches. Emu, **50** (3): 179–183,

1 fig.—*Platydema pascoei* is found in large numbers in the nests of several species of Australian Ploceidae, favoring those nests where there is a deposit of feces, but will live also on feathers and vegetable matter.—J. L. P.

HINDWOOD, K. A. 1951. The White-throated Honey-eater. Emu, **50** (3): 183–188, 2 figs.—Two very similar species, *Melithreptus albogularis* Gould and *Melithreptus lunatus* (Vieillot), occur in eastern Australia. The two are so similar that they are usually regarded as conspecific, but the author shows that there is an area of more than 1000 miles in which their ranges overlap and in which they both occur in the same general area and at times in association. There seems to be little if any difference in the habitat preference between the two species.—J. L. P.

HITCHCOCK, W. B. 1950. Notes on the Grey-mantled Albatross [*Phoebetria palpebrata*]. Emu, **50** (2): 135–137.—Specimen picked up dead on the beach of Discovery Bay, east of the mouth of the Glenelg River, Victoria (see Emu, 50 (1): 15) now in the National Museum of Victoria.

H., O. D. 1951. Obituary of E. W. Hendy. Brit. Birds, **44** (3): 83–86.—Author of many charming books on birds and a zealous worker for their protection.—M. M. N.

JAMES, R. F., AND N. D. MARTIN. 1950. A study of Screech Owls in southern Ontario. Can. Field-Nat., **64** (5): 177–180, 1 fig.—Use of nail kegs to attract owls for study of food habits. Directions for making and placing.

JORDAN, JAMES S., AND FRANK C. BELLROSE. 1950. Shot alloys and lead poisoning in waterfowl. Trans. 15th N. Amer. Wildl. Conf., 1950: 155–170.—Diet is an important variable in effecting lead poisoning. Wild seed diet did not slow down or affect the poisoning, but green leafy foods reduced mortality in affected ducks. One shot pellet seems to be enough to cause death by poisoning in a mallard drake.

KABAT, CYRIL, DONALD R. THOMPSON, AND FRANK M. KOZLIK. 1950. A device for dating natural events in game animals. Tech. Wildl. Bull. No. 1, Wis. Cons. Dept., 4 pp., 1 fig.—By recalibrating a slide rule, mass field data on birds of known age can be quickly reduced to hatching dates and the like.—J. J. H.

KABAT, CYRIL, DONALD R. THOMPSON, AND FRANK M. KOZLIK. 1950. Pheasant weights and wing molt in relation to reproduction with survival implications. Tech. Wildl. Bull. No. 2, Wis. Cons. Dept., ii + 26 pp., 8 tables, 2 figs.—Adult hens lost weight during egg-laying and reached a low at Wisconsin game farm mostly about July 17; wing molt and weight increased until early December, after which a flat weight curve continued to February. Primary molt in wild adults was correlated with age of broods.—J. J. H.

KELSALL, JOHN P. 1949. A study of bird populations in the apple orchards of the Annapolis Valley, Nova Scotia, with particular reference to the effects of orchard sprays upon them. Canadian Wildl. Serv., Wildl. Manag. Bull., Ser. 2, **1**: 1–69.—Breeding bird-populations usually average about one per acre but will rise to 11 per acre during insect outbreaks. The Robin is the only species that regularly establishes territories within orchards; other species come in principally for food and nest elsewhere. Poisoned sprays appear to exert no direct effect on the bird populations.

KELSO, LEON. 1950. The post juvenal molt of the Northeastern Screech Owl [*Otus asio naevius*]. Biol. Leaf. No. **50**: 1–3, 1 pl.

KESSEL, BRINA. 1951. Criteria for sexing and aging European Starlings (*Sturnus vulgaris*). Bird-Banding, **22** (1): 16–23.—Based on examination of over 1000 birds, 350 of which were made into skins. Bill and eye color are the most reliable

indicators of sex; length, shape, and iridescence of hackle feathers the best criterion of age.—M. M. N.

KIRKPATRICK, K. M. 1950. Common Mynah (*Acridotheres tristis*) nesting in the nest of Pied Mynah (*Sturnopastor contra*). Journ. Bombay Nat. Hist. Soc., **49** (3): 550–551.

KIRKPATRICK, KENNETH M. 1950. Peculiar roosting site of the House Swift (*Micropus affinis*). Journ. Bombay Nat. Hist. Soc., **49** (3): 551–552.—The swifts used abandoned nests of *Ploceus philippinus* as dormitories during a rainy period.—H. G. D.

KLUIJVER, H. N. 1950. Daily routines of the Great Tit, *Parus m. major* L. Ardea, **38** (3/4): 99–135, 6 figs., 6 tables.—Seasonal active periods, effect of weather, egg-laying, attentive periods, feeding.

LABITTE, ANDRÉ, A. LANGUETIF, AND G. DEBU. 1950. La reproduction du Faucon Pèlerin *Falco peregrinus peregrinus*. Tunstall 1771 et Autres Oiseaux dans les Falaises des Côtes de la Manche en 1949. Oiseau, **20** (2): 122–136, 3 figs.

LACK, DAVID. 1951. Migration through the Pyrenees. Bull. Brit. Orn. Club, **70** (9): 59–61.—Results of observations conducted in late September and October 1949 and 1950, to ascertain whether migration occurs through the high mountains, and whether there is a concentration of migrants on the west coast between the mountains and the sea.—J. L. P.

LAIRD, MARSHALL. 1951. Notes on the birds observed during a trans-Pacific sea voyage. Emu, **50** (3): 175–178.—Notes on sea birds seen between March 16 and April 5, 1950, between Wellington, New Zealand, and Balboa, Canal Zone.

LAMM, DONALD W., AND J. H. CALABY. 1950. Seasonal variation in bird populations along the Murrumbidgee in the Australian Capital Territory. Emu, **50** (2): 114–122.

LEACH, E. P. 1951. British-bred swallow summering in Norway. Brit. Birds, **44** (3): 100.—A nestling *Hirundo rustica* ringed on the Isle of Man, Aug. 11, 1949, was killed June 20, 1950, at Driva, Norway, some 700 miles to the northeast.—M. M. N.

LEARMONTH, NOEL F. 1951. Powerful Owls [*Ninox strenua*] in southwestern Victoria. Emu, **50** (3): 178, pl. 19.

LITTLEJOHNS, R. T. 1950. Further notes on the Mistletoe Bird and the mistletoe parasite. Emu, **50** (2): 84–90.

LORD, E. A. R. 1950. Notes on the Blue-faced Honeyeater [*Entomyzon cyanotis*]. Emu, **50** (2): 100–101.

LUNDY, WILLIAM E. 1951. "Poor-me-One" (*Nyctibius griseus*). Nat. Hist., **60** (3): 111–113, 1 fig.—Call notes.

MACDONALD, A. ST. J. 1950. Scent of game-birds. Journ. Bombay Nat. Hist. Soc., **49** (3): 556.—A query, with a reply by the editors (pp. 556–557).

MACDONALD, J. D. 1951. An account of the British Museum South West Africa Expedition. Bull. Brit. Orn. Club, **71** (2): 11–13.—An informal account of a six-months' expedition covering 5000 miles by truck in southwest Africa, including itinerary, brief description of the more important physical features, and mention of the more noteworthy species of birds seen and collected.—J. L. P.

MACNAIR, V. J. 1951. Notes on behaviour of blackbird. Brit. Birds, **44** (3): 99–100.—A female *Turdus merula* that nested in the author's garden was often heard, in October and November, singing a sub-song similar to that of a male.—M. M. N.

MARIEN, DANIEL. 1950. Notes on some Asiatic Meropidae (Birds). [Notes from the Walter Koelz Collections, Number 5.] Journ. Bombay Nat. Hist. Soc., **49** (2): 151–164, 1 text-fig. (map), 3 tables.—A critical revision of the five species of *Merops* and one of *Nyctyornis* known from Ceylon, India, Pakistan, and Iran, with comments on certain extralimital races. *Merops leschenaulti andamanensis* (Port Blair, South Andaman Island) is described as new. *Merops superciliosus* and *M. philippinus* are shown to be allopatric species, rather than subspecies. *Nyctyornis athertoni brevicaudata* Koelz (Hainan) is considered a valid race.—H. G. D.

MARIEN, DANIEL. 1950. Notes on some Asiatic Sturnidae (Birds). [Notes from the Walter Koelz Collections, Number 9.] Journ. Bombay Nat. Hist. Soc., **49** (3): 471–487, 1 map.—"The status of the genera has already been reviewed by Amadon . . . [Amer. Mus. Nov. No. 1237, 1943]; in this paper it has been possible to reassess the status of some of the lesser taxonomic groups of the Indian subregion. Some suggestions are made for further investigation in the field, two forms recognized in the New Fauna [of British India] are found not to be valid, a recently described race [is] confirmed, and a hitherto unnoticed plumage in *Saroglossa spiloptera* [is] studied" [author's introduction]. Recognition has, apparently unjustly, been refused two recently named Indian races: *Sturnus contra sordidus* Ripley and *Acridotheres cristatellus fumidus* Ripley (both from northeastern Assam).—H. G. Deignan.

MARLER, PETER, AND DERRICK J. BOATMAN. 1951. Observations on the birds of Pico, Azores. Ibis, **93** (1): 90–99.—The principal object of a brief visit (March 31 to April 16) was to study the variations in the ecological niche which a species may occupy on different islands and with different competing species. Thus, on Pico the Grey Wagtail, *Motacilla cinerea*, occupies the niches filled in Britain by both the Pied Wagtail, *Motacilla alba*, and the Rock Pipit, *Anthus spinoletta*, as well as the habitat normally occupied by the species. Similar niche expansion was noted in the Goldcrest, *Regulus regulus*, the Blackcap, *Sylvia atricapilla*, and the Kentish Plover, *Charadrius alexandrinus*. The song of the Chaffinch, *Fringilla coelebs*, differed markedly from that of the British form.—J. L. P.

MAY, D. J., AND A. MANNING. 1951. The breeding cycle of a pair of Wood Warblers [*Phylloscopus sibilatrix*]. Brit. Birds, **44** (1): 5–10.

MCGILL, ARNOLD R. 1951. An Australian review of the Sanderling. Emu, **50** (3): 197–206.—Summarizes the records of *Crocethia alba* for Australia.

MEANLEY, BROOKE, AND GORMAN M. BOND. 1950. A new race of Swainson's Warbler from the Appalachian Mountains. Proc. Biol. Soc. Wash., **63**: 191–194.—*Limnothlypis swainsonii alta* (Walhalla, South Carolina).

MEIKLEJOHN, M. F. A. 1950. Field identification of birds: notes on the Hoodwink (*Dissimulatrix spuria*). Journ. Bombay Nat. Hist. Soc., **49** (3): 557–560.—Reprinted from a British ornithological journal, this is a long, involved satire on "the number of records of birds partially seen or indeterminately heard: . . . it seems evident that the majority of these records are attributable to a single species —the Hoodwink—which I propose to name *Dissimulatrix spuria*." The jest is carried so far as to include a type locality, details on voice, breeding, etc., etc., and a list of allied forms (subspecies), with further reference to an extinct genus, *Palaeodissimulatrix!* One could wish that articles of this nature be omitted from the pages of serious journals.—H. G. Deignan.

MEIKLEJOHN, LT. COL. R. F. [obituary of]. 1951. Ibis, **93** (1): 135.

MEINERTZHAGEN, R. 1951. The significance of a dark ventral surface in certain birds. Ibis, **93** (1): 140–141.—The author finds that neither Harrison's hypothesis nor Armstrong's suggestion about the significance of a dark ventral surface in the breeding plumage of certain birds is completely satisfactory. He cites many examples among different orders where some species are so marked; in some cases it may play a part in courtship display; in others it may be of cryptic significance; in others its function is not clear. Evidently no single solution fits all cases.—J. L. P.

MEISE, W. 1950. On the status of *Eurystomus orientalis laetior* Sharpe. Journ. Bombay Nat. Hist. Soc., **49** (2): 305–306.—This is shown to be a well-defined subspecies, restricted to southwestern India and Ceylon.

MICHENER, JOSEPHINE R., AND HAROLD MICHENER. 1951. Notes on banding records and plumages of the Black-headed Grosbeak. Condor, **53** (2): 93–96.—Covering a 25-year period (1921–1945) at Pasadena, California, during which 707 were banded.

MILLER, LOYE. 1951. A Miocene petrel from California. Condor, **53** (2): 78–80, 1 fig.—*Oceanodroma hubbsi* described from near Capistrano Beach in Orange County.

MONTGOMERY, G. H., JR., W. H. RAWLINGS, AND L. MCL. TERRILL. 1949. Annual Report [of Prov. of Quebec Soc. for Protection of Birds]. (Prov. Que. Soc. Protection Birds, Montreal), pp. 1–40.—Summary of Christmas census and migratory movements of birds. Species accounts include records of occurrence, nesting, and numbers of individuals.

MOREAU, R. E. 1951. Relationships in *Pseudoalcippe*. Ibis, **93** (1): 138–139.—The author concludes that *P. atriceps* (Sharpe), *P. stierlingi* (Reichenow), and *P. abyssinicus* (Rüppell), together with their subspecies, are best regarded as a single species.

MURPHY, ROBERT CUSHMAN. 1951. Rediscovery of the Cahow. Bull. Brit. Orn. Club, **71** (2): 9–10.—*Pterodroma cahow* Nichols and Mowbray, until 1945 believed to be extinct, was rediscovered by Dr. and Mrs. Murphy January 26, 1951, "breeding in the islands off Bermuda."—J. L. P.

N., E. M. AND J. D. W. 1951. Obituary of Bernard William Tucker (1901–1950). Brit. Birds, **44** (2): 41–46.—"One of the most talented and devoted ornithologists of his time," Tucker was editor of 'British Birds,' and largely responsible for the sections on Habitat, Field-Characters, General Habits, and Voice in the 'Handbook of British Birds,' as well as writing three excellent contributions for Bent's 'Life Histories of North American Thrushes.'—M. M. N.

OGILVIE, C. M. 1951. The building of a rookery. Brit. Birds, **44** (1): 1–5.—Observations on nest building of *Corvus frugilevus* with particular attention to thieving of sticks. While one member of the pair gathered material and arranged it, the other stood guard; later these rôles were exchanged.—M. M. N.

OLIVIER, GEORGES. 1950. Notes sur quelques Oiseaux Rencontrés au Cours de Traversées de l'Atlantique-Nord. Oiseau, **20** (2): 137–147.

OTTOW, B. 1950. Die erbbedingte Osteogenesis dysplastico-exostotica der ausgerotteten flugunfähigen Riesentaube *Pezophaps solitaria* der Mascareneninsel Rodriguez. Kungl. Svenska Vetenskapsakademiens Handlingar. Fjärde Ser., **1** (9): 1–37, 8 pls.—English summary. The Solitaire of Rodriguez, a relative of the Dodo, is known only from early accounts and from numerous excavated bones. Leguat wrote of this bird: "The bone of their wings grows greater towards the extremity, and forms a little round mass under the feathers as big as a musket ball.

That and its beak are the chief defences of this bird." The bones of this bird show frequent more or less healed fractures, earlier assumed to be the result of injuries sustained in fighting with the armored wings. Ottow has re-studied this material with different conclusions: "A macroscopical and X-ray examination revealed a characteristic bone disease, which appears in two forms . . . The latter form can lead to bone fractures . . . it is probable that we have in Pezophaps a bone disease . . . which should be interpreted as a hereditary disease of the mesenchyme tissues . . . originating from a mutation of pathological value which could spread due to narrow geographical isolation, inbreeding and lack of selection. The case of Pezophaps can be compared to a breeding experiment with harmful genes carried out in Nature . . . here for the first time the existence of a well defined hereditary disease—that is not only a overspecialization of harmful nature —has been demonstrated to occur in Nature."—D. Amadon.

PARKS, G. HARGOOD. 1951. Plumage characters and age of Evening Grosbeaks. Bird-Banding, **22** (1): 23–32.—Color character combinations of 355 male and 387 female *Hesperiphona v. vespertina*. Older males had little black on the tertials and no white on the tail or primaries.—M. M. N.

PATEFF, PAWEL [obituary of]. 1951. Ibis, **93** (1): 135–137.

PHELPS, WILLIAM H., AND WILLIAM H. PHELPS, JR. 1950. Las Aves de Las Islas Los Roques y Las Aves y Descripción de un Nuevo Canario de Mangle. Bol. de Soc. Venezolana de Ciencias Nat., **13** (76): 7–24, 2 photos., 2 maps.—Nineteen birds new to these Venezuelan islands are recorded; about 275 specimens taken; species accounts of all forms found. *Dendroica petechia aurifrons*, new subspecies, from De Puerto de La Cruz, Anzoátequi.—H. I. F.

PHELPS, WILLIAM H., AND WILLIAM H. PHELPS, JR. 1950. Seven new subspecies of Venezuelan birds. Proc. Biol. Soc. Wash. ,**63**: 115–126, 1 fig. (map).—*Celeus elegans deltanus* (Jobure, Río Jobure, Territorio Delta Amacuro); *Celeus undatus amacurensis* (Misión San Francisco de Guayo, Territorio Delta Amacuro); *Dendrocincla fuliginosa deltana* (Misión Araguaimujo, Territorio Delta Amacuro); *Ochthoeca diadema meridana* (Cerro Mesa de Lino, 2600 meters, Santo Domingo, Mérida); *Euscarthmornis granadensis federalis* (No León, 2000 meters, Distrito Federal); *Mecocerculus leucophrys parui* (Cerro Parú, 1600 meters, Territorio Amazonas); *Oryzoborus crassirostris magnirostris* (Misión San Francisco de Guayo, Territorio Delta Amacuro), new subspecies.

PHILIPSON, W. R., AND C. C. DONCASTER. 1951. Birds seen in the North Atlantic. Brit. Birds, **44** (1): 11–13.

PHILLIPS, ALLAN R. 1951. Some observations of birds in southern Colorado. Condor, **53** (1): 50–51.—In San Luis Valley.

PHILLIPS, W. W. A. 1950. Wilson's Storm-petrels, shear-waters and other seabirds in the Gulf of Aden & Indian Ocean. Journ. Bombay Nat. Hist. Soc., **49** (3): 503–508.—Daily bird observations made on two recent voyages between Colombo and Aden.

PITELKA, FRANK A. 1951. Central American races of *Cyanolyca mitrata*. Condor, **53** (2): 97–98.—Two new subspecies of the Hooded Jay described, *C. m. guatemalae* (San José, 28 mi. ESE Comitán, Chiapas, Mex.) and *C. m. hondurensis* (Las Peinitas, 4 mi. W San Pedro Sula, Honduras).

PITELKA, FRANK A. 1951. Race names in the Central American jay, *Cyanolyca argentigula*. Journ. Wash. Acad. Sci., **41** (3): 113–115, 1 table.—A studious review of the species, in which *Cyanolyca blandita* Bangs is shown to be synonymous with *Cyanocitta argentigula* Lawrence. The type locality of the latter is restricted

to "near and more or less north of Pico Blanco, above Sipurio and probably in the drainage of the Río Lari," and *Cyanolyca argentigula albior* is described as new (type locality: Volcán Turrialba, 9,680 feet, Costa Rica).—H. G. D.

POPPER, DANIEL M. 1951. Notes on the birds of Mount Locke, Texas. Condor, 53 (1): 51–54.—Forty-two species seen in the Davis Mountains of Jeff Davis County, Texas. [See also Condor, 19: 161–165, 1917].

PRESTWICH, ARTHUR A. 1950. Records of parrots bred in captivity, part 1. (Lories and Lorikeets). (A. A. Prestwich, London), pp. 1–33. Price, 7/6 d.—Of special interest are the records of hybrids and the accompanying data on success or failure of certain cross-matings. These may give clues as to speciation in the wild.

PRESTWICH, ARTHUR A. 1950. Relevé des Psittacidés élevés en France. (A. A. Prestwich, London), pp. 1–47.—Records of the breeding of parrots in France—eggs laid, young hatched, young raised; common and scientific names.

PRICE, M. PHILIPS. 1950. Influences causing fluctuation of warbler population in cultivated lands and oak woods in the Severn Valley. Brit. Birds, 43 (11): 345–351. 8 tables.—A major factor is the change in vegetation associations which in turn have been affected by the activities of rabbits, and by man carrying on agricultural practices.

QUAINTANCE, CHARLES W. 1951. Pioneer Starling nesting in eastern Oregon. Condor, 53 (1): 50.—In May, 1950, near La Grande.

RANKIN, W. T. C. 1951. Trances of trapped Starlings [*Sturnus vulgaris*]. Brit. Birds, 44 (2): 59.

RASPET, AUGUST. 1950. Performance measurements of a soaring bird. Aeronautical Engr. Rev., 9 (12): 1–4, 6 figs.—A sail-plane was used in following soaring birds to make measurements of air speed, angles of banking, rate of sinking, and changes in shape and position of the birds' wings. The absence of a motor cut noise to a minimum and allowed approach to within about 15 feet of some flying birds. A camera mounted in the windshield permitted action photographs, and a radio made it possible for a running commentary by the pilot to be recorded by a ground crew. It was found that vultures, particularly *Coragyps*, the Black Vulture, had good speed ranges for gliding, as shown by plotted data, an extremely low sinking speed in soaring flight, and the possibility of very slow flight (8.5 meters per second). Study of the action of wing-tip slots (the spaces between the outspread primaries) shows they are closed to reduce drag. There is some indication that the wing-tips are used as diffusors to increase the effective aspect ratio of the wing. Further, the porosity of the feathers may be a factor in inducing laminar flow of air over the entire body; this may explain the low drag coefficients computed for certain birds.—H. I. Fisher.

REEDER, WILLIAM G. 1951. Stomach analysis of a group of shorebirds. Condor, 53 (1): 43–45.—Based on 27 birds of eight species taken in southern California, some from a sand or shore situation, others from mudflats, with differences in diet noted between the two groups.

RIPLEY, S. DILLON. 1951. Notes on Indian birds IV. Some recently collected birds from Assam. Postilla [Yale Peabody Mus. Nat. Hist.], No. 6: 1–7.—*Arborophila torqueola interstincta* (Mt. Zephu, 93 miles east of Kohima, eastern Naga Hills); *Indicator xanthonotus fulvus* (Pfutsero, eastern Naga Hills); *Dendrocopos darjellensis fumidus* (Mt. Japvo, Naga Hills); *Spelaeornis chocolatinus nagaensis* (Mt. Japvo, Naga Hills); *Phylloscopus fuscatus mariae* (Moirang, Manipur); *Horeites flavolivaceous* [sic] *alexanderi* (Phek-Meluri Road, 60 miles east of Kohima, Naga Hills).

ROLLIN, NOBLE. 1951. Dawn chorus in March. Dawn Song and All Day, **1** (4): 33–41, 2 figs.

ROLLIN, NOBLE. 1951. All-day song totals I. Dawn Song and All Day, **1** (4): 42.

ROSEVEARE, W. L. 1950. Notes on birds of the irrigated area of Minbu District, Burma. Journ. Bombay Nat. Hist. Soc., **49** (2): 244–287, 2 maps.—Notes compiled from visual observations and considered supplementary to facts already recorded in Smythies's Birds of Burma. Particular attention was paid to the status of each species throughout the year and, in the case of migrants, earliest and latest dates are given. The nomenclature is binominal and taken without change from Stuart Baker's outmoded edition of The Fauna of British India, Birds.—H. G. D.

RUDEBECK, GUSTAF. 1950. Studies on bird migration. Based on field studies in southern Sweden. Vår Fågelvärld, Suppl. 1, pp. 1–148, 4 pls., many tables.—This field study was undertaken at Falsterbo in the southwest corner of the Swedish mainland in the late summer and early fall months of 1942 through 1949. Only daytime migrations were studied. It was early noted that the "broad front" of the pathways of birds migrating to the southwest in Sweden narrows or funnels into Falsterbo; thus many of the birds leave by way of this most extreme point of land.

In his attempt to determine the cause for such "funneling," Rudebeck has come to regard the "Leitlinie" or "guiding line" (of von Schweppenburg) as the primary factor. The line in this case is the coast; its effect is strengthened by the unwillingness of land birds to fly over a strange biotope, the sea. When the guide line deviates more than about 90 degrees from the line of migratory flight, the birds follow the migratory line—in this case, southwest over the sea. Weather plays an important rôle in timing the flight, although the migratory unrest eventually forces the birds to move. Rudebeck, incidentally, regards this restlessness as the same in migratory and non-migratory forms, and notes the influence of the weather even upon resident species.

The author emphasizes the similarity between the movements of migratory, irruption, and strictly resident birds. He finds all sorts of intermediates in migratory behavior and much individual or intraspecific variation; during certain years he found resident magpies attempting the ocean crossing, only to return "in full panic" (p. 51). Such manifestations of unrest usually follow a period of good weather, and the author regards the situation thus—the threshold for resident forms is high, and by the time they begin to show restlessness the good weather ends and further manifestations are not shown. Thus the line between migratory and resident birds is pretty fine.

It is pointed out that the length of the migratory flight increases for different populations of the same species as one goes eastward from Europe to Siberia. Along with this we find that more eastern than western forms are migratory, and that, whereas birds in the western part of the Palearctic migrate more or less north and south, the line of flight inclines eastward until it is east-northeast and west-southwest, or even east and west.

The last 60 pages are devoted to tables listing the daily number of migrants of certain species in the autumns of 1942, 1943, and 1944. There is a two-page bibliography, primarily of continental literature.—H. I. Fisher.

SCHILLER, EVERETT L. 1951. Hymenolepis hopkinsi, n. sp., a cestode from the Black Duck (*Anas rubripes*). Amer. Midl. Nat., **45** (1): 253–256, 5 figs.

SCHILLER, EVERETT L. 1951. Studies on the helminth fauna of Alaska. VI. The parasites of the Emperor Goose (*Philacte canagica* L.) with the description of *Hymenolepis philactes*, n. sp. Journ. Parasit., 37 (2): 217–220, 1 pl.

SCHWARTZ, CHARLES W., AND ELIZABETH R. SCHWARTZ. 1951. A survey of the Lace-necked Dove (*Streptopelia c. chinensis*) in Hawaii. Pacific Sci., 5 (1): 90–107, 8 figs., 3 tables.—These birds are resident on all islands from sea level to at least 4,000 feet. Population is estimated at 89,000 birds, with densities up to 200 per square mile. Food consists of 99.5 per cent vegetable matter, and water is a prerequisite. Roosting and feeding areas may be as far as five miles apart. Breeding may occur throughout the year, but the main season is February through September. Sex ratio of 79 birds was 119 males to 100 females. Measurements of 33 adult males and 26 adult females are given.—H. I. F.

SERVENTY, V. N., AND S. R. WHITE. 1951. The Roseate Tern: Notes on the nesting behavior. Emu, 50 (3): 145–151, pls. 12–13, 2 figs.—Notes based on the nesting behavior of *Sterna dougallii* on Pelsart Island in the Abrooholos Group, Western Australia, December, 1940, to January, 1949.

SIBLEY, CHARLES G. 1951. Notes on the birds of New Georgia, central Solomon Islands. Condor, 53 (2): 81–92, 1 fig.—Notes on occurrence, ecology, life history, behavior, and relationship between molt and gonadal development of 57 species, 37 of which are represented by specimens.

SICK, HELMUT. 1950. Apontamentos sôbre a ecologia de "Chaetura andrei meridionalis" Hellmayr no estado do Rio de Janeiro (Micropodidae, Aves). Rev. Brasil. Biol., 10: 425–436.

SICK, HELMUT. 1950. Una nova raça de Cardeal procedente do Brasil Central, "Paroaria baeri xinguensis" n. ssp. (Fringillidae, Aves). Rev. Brasil Biol., 10 (4): 465–468.—From Alto Xingu, Mato Grosso, 11° 25′ S, 53° 7′ W.

SICK, H. 1950. Der Regenruf des Buchfinken (*Fringilla coelebs*). Vogelwarte, 4: 236–237.

SKUTCH, ALEXANDER F. 1951. Congeneric species of birds nesting together in Central America. Condor, 53 (1): 3–15, 1 table.—Comparisons and discussions of ecological factors or isolating mechanisms.

SMITH, T. E. H. 1950. Black Drongos [*Dicrurus macrocercus*] fostering a Koel [*Eudynamis scolopaceus*]. Journ. Bombay Nat. Hist. Soc., 49 (2): 304.

SMITHERS, REAY H. N. 1951. The question of *Larus n*[*ovaehollandiae*] *hartlaubi* in Northern Rhodesia. Ibis, 93 (1): 137.—Re-examination of the specimen previously recorded under this name proves it to be an immature of *Larus cirrhocephalus* Vieillot.—J. L. P.

SMITHERS, REAY H. N. 1951. *Agapornis lilianae* in Southern Rhodesia. Ibis, 93 (1): 138.—Specimen obtained and flocks seen; new for Southern Rhodesia.

SOUTHERN, H. N. 1951. Melanic Blackcaps in the Atlantic islands. Ibis, 93 (1): 100–108.—*Sylvia atricapilla* is resident on the Cape Verde and Canary islands and on Madeira and the Azores. A melanic variety occurs on nearly all of the Azores and on Madeira in a frequency of about two per cent; in the Canary Islands it has been found only in the Great Crater of La Plama where it now is uncommon if not extinct. There is no detailed information available about the population of the Cape Verde Islands. Data from the literature shows that the melanic variety interbreeds with normal birds and probably behaves as a single-factor recessive.—J. L. P.

SPRUNT, ALEXANDER, JR. 1950. Hawk predation at the Bat Caves of Texas.

Texas Journ. Sci., **2** (4): 463–470, 8 photos.—Sharp-shinned, Red-tailed, Duck, and Sparrow hawks catching Mexican free-tailed bats.

STEINBACHER, JOACHIM. 1950. Weitere Bemerkungen über die 'Hornschwalme' (*Batrachostomus*) des Senckenberg-Museums. Senckenbergiana, **31**: 297–298.

STRANDTMANN, R. W. 1951. The mesostigmatic nasal mites of birds. II. New and poorly known species of Rhinonyssidae. Journ. Parasit., **37** (2): 129–140, 5 pls.—New forms of these parasites described for shorebirds, ducks, and geese.

SUTTON, GEORGE MIKSCH. 1951. Birds and an ant army in southern Tamaulipas. Condor, **53** (1): 16–18.—Numerous birds in thick scrubby woodland feeding on insects fleeing from an advancing ant army.

TORDOFF, HARRISON B. 1951. Osteology of Colinus hibbardi, a Pliocene Quail. Condor, **53** (1): 23–30, 2 figs., 4 tables.—Identification of elements and measurements of much additional material from Meade County, Kansas.

TRAYLOR, MELVIN A., JR. 1950. A new subspecies of tanager from Brazil. Nat. Hist. Misc. No. **64**: 1–2.—*Tangara cyanicollis albotibialis* from Veadeiros, Goyaz, Brazil.

TRAYLOR, MELVIN A., JR. 1951. A review of the woodpeckers *Chrysoptilus melanochloros* and *C. melanolaimus*. Fieldiana Zool., **31** (41): 421–437, 1 fig.—Examination of 245 specimens. Recognizes two species and 10 subspecies.

TRISCHITTA, ANTONINO. 1950. Per una Nomenclatura Biologica Ternaria Plurinominale. Atti (Accad. Peloritana, Classe di Sci. Fis. Mat. e Nat.), **48** (3 of series 4): 1–40.—A rather complicated system of nomenclature is proposed. By using prefixes made up of the first two or three letters of the various taxonomic categories the author compounds a word to indicate the classification down to order. This word is followed by one compounded of family and generic names and one composed of species and subspecies. Thus, for *Sarothrura elegans languens* there would be *Zochoavegruides rallisarothrura elegantölanguens*. Theoretically then, anyone, with or without a knowledge of birds, could tell that this was an animal (*Zo*), chordate (*cho*), a bird (*ave*) of the Gruiformes (*gruides*) and the family Rallidae (*ralli*).

This system of designating animals has its advantages, as did others in the past, but it is cumbersome, would require extensive revision of method, and offers little that in a few words could not be better stated and more easily understood.—H. I. F.

TURCHE, F. J. 1950. The Great Spotted Woodpecker, *Dendrocopos major* (L.), as a carrier of the Monilia rot. Vär Fägelvärld, **9** (4): 210–212, 2 photos.—This fungus disease of fruits may be transmitted, by the feeding habits of this bird, from area to area.

VAN CLEAVE, HARLEY J., AND RALPH B. WILLIAMS. 1951. Acanthocephala from passerine birds in Alaska. Journ. Parasit., **37** (2): 151–159, 2 pls.—These parasitic worms recorded from Northwestern Robin, Varied Thrush, and the Fox Sparrow.

VAN SOMEREN, V. G. L., AND G. R. C. VAN SOMEREN. 1949. The birds of Bwamba. Suppl. to Vol. 13 of The Uganda Journal, 111 pp., map, 23 photos, paper. (The Uganda Soc., Kampala, Uganda, 7½ shillings).—Bwamba is an area in western Uganda along the Belgian Congo border. It includes part of the Ruwenzori region. It is much more forested than most of Uganda, and as a result the van Somerens, during four field trips there in recent years, were able to add almost 30 species, chiefly forest dwellers, to the avifauna of Uganda. Their annotated list of the birds of this interesting region contains many ecological and life history notes and occasional taxonomic comments. There is, for example, detailed

information on such little-known birds as *Columba albinucha*. The extensive data on breeding seasons is of especial interest since Bwamba lies on the equator. In general, it was found that many birds have a prolonged breeding season, with some individuals breeding at one time of the year and some at others. The photographs are all of the country, not of birds.—D. Amadon.

VAURIE, CHARLES. 1950. Notes on some Asiatic titmice. Amer. Mus. Novit., No. **1459**: 1–66, 3 figs.

VAURIE, CHARLES. 1950. Notes on some Asiatic nuthatches and creepers. Amer. Mus. Novit., No. **1472**: 1–39, 2 figs.—*Sitta europaea koelzi* (Patkai Hills, Assam-Burma border) new subspecies.

VAURIE, CHARLES. 1951. Notes on the wrens and dippers of western Asia and India. Amer. Mus. Novit., No. **1485**: 1–19.—The eighth in a series of taxonomic papers based chiefly upon the collections of Dr. Walter Koelz.

WADLEY, N. J. P. 1951. Notes on the birds of Central Anatolia. Ibis, **93** (1): 63–89, 1 text fig. (map).—Brief description of the Central Anatolian plateau followed by carefully annotated list of the species collected and observed during the author's residence from 1943 to 1946.—J. L. P.

WARREN, R. L. M. 1951. On the type of *Alauda Penicillata* Gould. Bull. Brit. Orn. Club, **71** (2): 13–14.—Shows that an error exists in vol. 13 of the 'Catalogue of Birds in the British Museum' where on p. 532 under *Otocorys penicillata* three specimens are listed as "types of the species" where it is clear from the original diagnosis that the description was based on a single specimen.—J. L. P.

WEBSTER, J. DAN. 1951. Systematic notes on North American Acoleidae (Cestoda). Journ. Parasit., **37** (2): 111–118, 9 figs., 1 table.—Several forms described as parasites in shorebirds.

WETMORE, ALEXANDER. 1950. Additional forms of birds from the republics of Panamá and Colombia. Proc. Biol. Soc. Wash., **63**: 171–174.—*Crypturellus saltuarius* (Ayacucho, 500 feet, 25 kilometers east of La Gloria, Magdalena, Colombia); *Geotrygon goldmani oreas* (1250 feet altitude, above Quebrada Cauchero, Cerro Chucantí, Serranía de Majé, eastern Provincia de Panamá, Panamá); *Cyclarhis gujanensis flavens* (Chimán (Punta Madroño), Province of Panamá, Panamá), new subspecies.

WILSON, HUGH. 1950. Visual perception among waders: a suggested explanation of the habit of "bobbing." Emu, **50** (2): 128–131, 1 fig.—Suggests that raising the head causes the horizontal lines of the foreground to move against the horizon, thus enabling the bird to judge the relative distance of objects.

WING, LEONARD W. 1950. Size of summer bird grouping, Texas to the Yukon. Can. Field-Nat., **64** (5): 163–169, 3 figs., 3 tables.

WOODBURY, A. M., AND HOWARD KNIGHT. 1951. Results of the Pacific gull color-banding project. Condor, **53** (2): 57–77, 11 figs. in text.—Final summary of the gull study undertaken by the Western Bird-Banding Association, 1937 to 1942, during which were banded 14,091 gulls of three species, *Larus glaucescens*, *L. occidentalis*, and *L. californicus*. Analysis of data on nesting, migration, longevity, mortality and population shifts.

YEATTER, RALPH E. 1950. Effects of different preincubation temperatures on the hatchability of Pheasant eggs. Science, **112** (2914): 529–530, 1 table.—Hatchability decreased nearly 50 per cent when temperature in the controlled experiments was raised from 62° F. to 88° for seven days prior to incubation.

OBITUARIES

RUDOLF BENNITT, an Associate of the A. O. U. since 1932, died February 2, 1950, in Columbia, Mo. He was born at Springfield, Massachusetts, on December 22, 1898, and attended Boston University, receiving the degrees of Bachelor of Science in 1920 and Master of Arts in 1921. For further graduate training he went to Harvard University as a Thayer Fellow and worked with Dr. G. H. Parker, completing his Doctorate of Philosophy in 1923. He was married in the same year to Ruth Eunice Eynon.

After acting as instructor at the Marine Biological Laboratory at Woods Hole he served two years as Assistant Professor of Zoology at De Pauw University and three years at Tufts College. He came to the University of Missouri in 1927, where he remained until his death 23 years later. Since 1944 he held the title of William Rucker Professor of Zoology.

Abandoning his first interest in the physiology of crustacea, he published his first ornithological paper in 1932, 'Check-list of the birds of Missouri' (Univ. Mo. Studies, 7 (3): 1–81). From this time on he devoted his entire efforts to the field of conservation. In 1937 he served as first president of the Wildlife Society and with Werner O. Nagel published, 'A Survey of the Resident Game and Furbearers of Missouri' (Univ. Mo. Studies, 12 (2): 1–215). As a teacher of ornithology, ecology, and conservation courses, and as first chairman of the Missouri Cooperative Wildlife Research Unit, his influence will long be felt in Missouri and elsewhere.

In spite of a busy life as teacher and administrator, he published frequently in journals devoted to conservation and made important contributions to our thinking concerning Bob-whites, Pheasants, and Prairie Chickens (see Trans. N. Amer. Wildl. Conferences). His most important work, 'Some Aspects of Missouri Quail and Quail Hunting' reports ten years of research and is being published posthumously by the Missouri Conservation Commission as Number 2 in their technical series (1951).—WILLIAM H. ELDER.

EDGAR BURKE, an Associate of the A. O. U. since 1942, was born February 3, 1890, in Hamburg, Germany, where his father was U. S. consul. He attended the College of Physicians and Surgeons, New York City. For several years he was resident surgeon at Belleview Hospital, New York, then Surgical Director and Assistant Medical Director of the Jersey City Medical Center. Burke was a skilled fly fisherman and author of 'American dry flies and how to tie them.' He was also an ardent wildfowler and upland gunner, contributing several chapters to 'Duck shooting along the Atlantic tidewaters.' He was also interested in archaeology and assembled a notable collection of pre-Columbian artifacts. Highly successful in raising homing pigeons, he provided the U. S. Signal Corps in World War II with some of their finest birds. He also had Pheasants, Cockatoos, Parakeets, and Ring-necked Doves. An accomplished artist, he furnished several paintings for ornithological books and the beautiful plates of flies in 'Salmon in low waters' by Richard C. Hunt. Death occurred at Norfolk, Connecticut, December 6, 1950.—A. W. SCHORGER.

HENRY WARD CARRIGER, an Associate of the American Ornithologists' Union, died as the result of an accident in Red Bluff, California, October 1, 1949, at the age of 75. He was crossing Main Street about dusk the previous evening when he was struck by an automobile driven by a 14-year-old boy and died in the hospital seven hours later.

He was born in Sonoma, California, June 12, 1874, and made his home in Oakland. His occupation was that of traffic manager for a coffee company, but he was retired at the time of his death. Carriger became interested in birds at an early age and was

an active and energetic observer. He joined the Cooper Ornithological Club in 1899 and was elected an Associate of the A. O. U. in 1913.

His publications comprised about 20 brief notes, dealing mainly with nesting habits of birds, and were contributed between 1899 and 1931 to 'The Condor,' 'Nidologist,' 'Oologist,' and 'Osprey.' Several of them were published in cooperation with Milton S. Ray, J. R. Pemberton, and W. E. Unglish. His most extended paper, published with Pemberton, a 'Partial List of the Resident Land Birds of Monterey County,' including notes on about 100 species, appeared in 'The Condor' in 1915. Surviving members of his family include his wife, Carolyn, his son Gerald, and four married daughters.—T. S. PALMER.

EDMONDE SAMUEL CURRIER, an Honorary Life Associate (1894) was born at Keokuk, Iowa, June 21, 1868, and died at Portland, Oregon, April 25, 1949. His early education was received in Iowa.

During his early boyhood he developed a keen interest in birds and started a collection of eggs in the lake country of Iowa. Shortly after he reached the age of 20 he came west and settled in Tacoma, Washington, where he lived for several years, all the while continuing his interest in birds, and building up his collection of nests and eggs. In 1905 he moved to Portland, Oregon, and established a general merchandise business which developed into one of the most enterprising department stores in northeast Portland.

Currier was a member of the Cooper Ornithological Club, Pacific Northwest Bird and Mammal Society and the local Audubon Society. For many years he cooperated with the U. S. Biological Survey in reporting bird migration data. He published only a few short notes on birds.

The surviving members of the Currier family, Mrs. Alice H. Currier and sons, Robert H. and John E. Currier, have donated the entire collection of nests and eggs, the ornithological library and personal field notes to the Zoology Department of the University of Portland, Portland, Oregon, where it will be known as the Edmonde Samuel Currier Collection.

As a fellow worker in ornithology, "Ed" Currier was most cooperative. His field notes and his collections were freely made available to others interested in birds. His passing left a host of friends who will always remember his congenial nature, his enthusiasm, his energy and liberality. To have known him as a co-worker in ornithology and as a friend was a real privilege.—STANLEY G. JEWETT.

CHARLES WILLIAM GUSTAVE EIFRIG, elected an Associate of the American Ornithologists' Union in 1901 and a member in 1929, died in Windermere, Florida, November 1, 1949, at the age of 78. He was born in Doebeln, Saxony, Germany, September 23, 1871. At the age of seven, he emigrated with his family to Freedom, Pennsylvania, where he completed his elementary school training. He graduated from Concordia College, Fort Wayne, Indiana, in 1892 and from Concordia Theological Seminary in 1895. During the following 14 years, he was the pastor of Lutheran churches in McKee's Rock, Pennsylvania, Cumberland, Maryland, and Ottawa, Canada. Valparaiso University conferred upon him the degree of Doctor of Science, *honoris causa*, in 1943.

In 1909, Dr. Eifrig was appointed to the faculty of Concordia Teachers College, then at Addison, Illinois. This institution was transferred in 1913 to River Forest, Illinois, and he went with it, remaining there until his retirement in 1942. He was married to Marie Meyer at Fort Wayne, Indiana, on October 2, 1895, and they had seven children.

Dr. Eifrig was an active member of the Wilson Ornithological Club from 1907 on and was president of the Illinois Audubon Society, 1930–41. He was also a member of the American Society of Mammalogists, the Chicago Ornithological Society, the Kennicott Club of Chicago, and the Illinois Academy of Sciences. He was an enthusiastic and active field naturalist and made a collection of birds, many of them mounted. This collection is now the property of Saint Mary of the Lake Seminary at Mundelein, Illinois.

Dr. Eifrig published a considerable number of papers on birds, seven of which are mentioned in my 'Bibliography of Birds.' He also published two elementary textbooks (Rand, McNally & Co.) having the title Our Great Outdoors; one of these, published in 1928, was on mammals, and the other (1930) was on fishes, amphibia, and reptilia. It was reported that he had a manuscript for a third book, on birds, awaiting publication at his death. For many years, he contributed monthly articles on nature to various Lutheran magazines.—R. M. Strong.

Arthur Hudson Helme, a Life Associate elected in 1888, was born in Miller Place, New York, November 20, 1860. He was educated at Brown's Business College, and New York University from which institution he received a degree in veterinary science. Many years ago he sold his veterinarian business and turned his hobby of ornithology into a profession. He was an expert taxidermist and worked at the Brooklyn Museum and the American Museum of Natural History, New York. The latter has his notes covering a period of about 60 years. His notable collection of birds and mammals was disposed of prior to his death, but his widow, Martha L. Helme, still has his collection of eggs. Helme was descended from colonial stock, on his mother's side from Stephen Hopkins, a signer of the Mayflower compact, and on his father's from Thomas Helme who held various town and county offices from 1680–1710. Death occurred at Port Jefferson, New York, November 20, 1947.—A. W. Schorger.

Frederick Arnold Hemphill, elected an Associate of the A. O. U. in 1929, died in Elizabeth, New Jersey, March 1, 1949. He was born in this city August 31, 1890. After attending Amherst College, he graduated from the New York Law School in 1915 and specialized in realty law. He was a member of the New Jersey Bar Association and the Union County Bar Association of which he was Secretary for a period. He was also a member of the National Audubon Society. His interest was primarily in oölogy and he contributed several articles to the 'Oologist.' His collection of approximately 300 nests and 400 sets of eggs was presented by his wife, Ruth F. Hemphill, to the New Jersey College for Women, New Brunswick, N. J.—A. W. Schorger.

Ardelle Emery Hornback (Mrs. Alvan A. Hornback), an Associate of the A. O. U. since 1949, died in a hospital at Joliet, Illinois, August 18, 1950. She was born in Monroe Township, Mahaska County, Iowa, February 13, 1882. Following attendance at Drake and Iowa Wesleyan universities, she taught school until her marriage in 1904. She was very active in civic affairs during residence at Napierville and Plainfield, Illinois. Due to her great interest in birds she contributed a column on conservation to the Plainfield 'Enterprise' and was instrumental in founding Junior Audubon Clubs. She was a member of the National Audubon Society, Wild Flower Preservation Society, and the Wilderness Society.—A. W. Schorger.

Austin Roberts, Corresponding Fellow of the American Ornithologists' Union, elected in 1920, met his death, May 5, 1948, in an automobile accident near Lusikisiki, Pondoland. The son of Archdeacon Alfred Roberts, he was born in Pretoria on

January 3, 1883. Due to an unusually successful collecting trip in Portuguese East Africa in 1908, he was appointed Curator of birds and mammals in the Transvaal Museum, Pretoria, in September, 1910. He continued to serve in this capacity, though at the time of his death he carried the title of Senior Assistant.

Roberts took part in 46 expeditions and was a very capable field naturalist, being equally at home with birds and mammals. He published 117 papers on birds and mammals, approximately 75 of which were on birds. Of his important publications, mention should be made of: 'The Grass Warblers of South Africa (*Cisticola* and *Hemipteryx*),' Ann. Trans. Transvaal Mus. 1913, 3: 227–266; and 'Birds of South Africa,' (1940), the seventh being the last edition. Prior to death he had completed the manuscript of a book, 'The Mammals of South Africa,' and had made considerable progress on a voluminous treatise on South African birds.

He served as President, Secretary, and Co-editor of the South African Ornithological Society, the founding and growth of which were due largely to his efforts. Among his honors were: British Empire Member of the British Ornithologists' Union (1930); Senior Captain Scott Memorial Medal of the Biological Society (1938); Medal and Grant of the South African Association for the Advancement of Science (1940).—A. W. Schorger.

Leonard Cutler Sanford, of New Haven, Connecticut, a patron of ornithology in the grand sense of the word, died at his winter home in Florida on December 7, 1950.

He was born in New Haven on September 19, 1868, was a Yale graduate, and a successful and gifted surgeon. His abiding interest throughout life, however, was ornithology. In his early years he began to build up what became a virtually complete, well-chosen, and extraordinarily beautiful collection of study skins of North American birds, which now forms part of the resources of the American Museum of Natural History.

Dr. Sanford became an Associate of the A. O. U. in 1902 and a Life Associate in 1919. He was much more than a hobbyist, because his knowledge of the birds of the world was in some ways extraordinarily extensive. He was also the principal author of a book written primarily for sportsmen, namely 'The Water-Fowl Family,' by L. C. Sanford, L. B. Bishop, and T. S. Van Dyke, a volume of 598 pages published by the Macmillan Company in 1903.

In February, 1921, he was elected a Trustee of the American Museum of Natural History, a capacity in which he served for nearly 30 years. From long before that period, however, he had begun to develop as the most effective individual in the history of the world for promoting large-scale ornithological activities. He acquired for the Museum very many examples of extinct birds and of rare species and genera. He persuaded Frederick F. Brewster, of New Haven, to finance the South American ornithological circumnavigation of the late Rollo H. Beck, which continued from 1912 to 1917, and the scientific results of which have been published in part in R. C. Murphy's 'Oceanic Birds of South America' (1936). Through Dr. Sanford's influence, the late Harry Payne Whitney made a princely gift that led to the building of Whitney Memorial wing, which houses the department of birds in the American Museum. Mr. Whitney's interest and support were further held by Dr. Sanford throughout the many years of the Whitney South Sea Expedition, which probably represents the most extensive piece of ornithological field work that has ever been undertaken. Subsequently, and again through the persuasiveness of Dr. Sanford, Mrs. Whitney and her children purchased for the American Museum the collection

of birds of the world, numbering 280,000 specimens, which the late Lord Rothschild had assembled in his private museum at Tring, Hertfordshire.

Dr. Sanford was a man of such unique personality that he will always be remembered by his friends as an unforgettable character, somewhat apart from the ordinary run of mankind. He could be extremely winning, and yet his terrific drive and single-track purpose for the ends of the Museum's department of birds were at times something almost to be dreaded. His zeal derived from his sporting instinct no less than from scientific interest. He seemed to enjoy the rivalry with other individuals endeavoring to build up museums containing the most representative collection of the world's avifauna, and it gave him and his associates endless satisfaction that he won out over all competitors.

Dr. Sanford's will included a generous bequest of funds to the American Museum of Natural History. His tangible memorial is the Sanford Hall of Biology of Birds in that institution, a feature of which is his handsome head in bronze, the sculpture of Joy Buba.—ROBERT CUSHMAN MURPHY.

Meetings of the American Ornithologists' Union

Meeting	*Date*	*Place*
1	1883, Sept. 26–28	New York
2	1884, Sept. 30–Oct. 2	New York (2)
3	1885, Nov. 17–18	New York (3)
4	1886, Nov. 16–18	Washington
5	1887, Oct. 11–13	Boston and Cambridge
6	1888, Nov. 13–15	Washington (2)
7	1889, Nov. 12–15	New York (4)
8	1890, Nov. 18–20	Washington (3)
9	1891, Nov. 17–19	New York (5)
10	1892, Nov. 15–17	Washington (4)
11	1893, Nov. 20–23	Cambridge (2)
12	1894, Nov. 12–15	New York (6)
13	1895, Nov. 11–14	Washington (5)
14	1896, Nov. 9–12	Cambridge (3)
15	1897, Nov. 8–11	New York (7)
16	1898, Nov. 14–17	Washington (6)
17	1899, Nov. 13–16	Philadelphia
18	1900, Nov. 12–15	Cambridge (4)
19	1901, Nov. 11–14	New York (8)
20	1902, Nov. 17–20	Washington (7)
20a	1903, May 15–16	San Francisco
21	1903, Nov. 16–19	Philadelphia (2)
22	1904, Nov. 28–Dec. 1	Cambridge (5)
23	1905, Nov. 13–16	New York (9)
24	1906, Nov. 12–15	Washington (8)
25	1907, Dec. 9–12	Philadelphia (3)
26	1908, Nov. 16–19	Cambridge (6)
27	1909, Dec. 6–9	New York (10)
28	1910, Nov. 14–17	Washington (9)
29	1911, Nov. 13–16	Philadelphia (4)
30	1912, Nov. 11–14	Cambridge (7)
31	1913, Nov. 10–13	New York (11)
32	1914, April 6–9	Washington (9)
33	1915, May 17–20	San Francisco (2)
34	1916, Nov. 13–16	Philadelphia (5)
35	1917, Nov. 12–15	Cambridge (8)
36	1918, Nov. 11	New York (12)
37	1919, Nov. 10–13	New York (13)
38	1920, Nov. 8–11	Washington (11)
39	1921, Nov. 7–10	Philadelphia (6)
40	1922, Oct. 23–26	Chicago
41	1923, Oct. 8–11	Cambridge (9)
42	1924, Nov. 10–13	Pittsburgh
43	1925, Nov. 9–12	New York (14)
44	1926, Oct. 11–14	Ottawa
45	1927, Nov. 14–17	Washington (12)
46	1928, Nov. 19–22	Charleston
47	1929, Oct. 21–24	Philadelphia (7)

Meeting	*Date*	*Place*
48	1930, Oct. 20–23	Salem
49	1931, Oct. 19–22	Detroit
50	1932, Oct. 17–20	Quebec
51	1933, Nov. 13–16	New York (15)
52	1934, Oct. 22–25	Chicago (2)
53	1935, Oct. 21–24	Toronto
54	1936, Oct. 19–22	Pittsburgh (2)
55	1937, Nov. 15–19	Charleston (2)
56	1938, Oct. 17–22	Washington (13)
57	1939, June 19–24	San Francisco (3) and Berkeley
58	1940, Sept. 9–13	Cambridge (10) and Boston (2)
59	1941, Sept. 1–6	Denver
60	1942, Oct. 12–16	Philadelphia (8)
61	1943, Oct. 20	New York (16)
62	1944, Oct. 25	New York (17)
63	1945, Oct. 24–25	Cambridge (11) and Boston (3)
64	1946, Sept. 2–6	Urbana-Champaign
65	1947, Sept. 8–12	Toronto (2)
66	1948, Oct. 11–15	Omaha
67	1949, Oct. 10–14	Buffalo
68	1950, Oct. 8–13	Minneapolis and St. Paul

Officers of the American Ornithologists' Union, Past and Present

Presidents

*J. A. Allen, 1883–1890
*D. G. Elliot, 1890–1892
*Elliott Coues, 1892–1895
*William Brewster, 1895–1898
*Robert Ridgway, 1898–1900
*C. Hart Merriam, 1900–1903
*Charles B. Cory, 1903–1905
Charles F. Batchelder, 1905–1908
*E. W. Nelson, 1908–1911
*Frank M. Chapman, 1911–1914
*A. K. Fisher, 1914–1917
*John H. Sage, 1917–1920
*Witmer Stone, 1920–1923
*Jonathan Dwight, 1923–1926
Alexander Wetmore, 1926–1929
*Joseph Grinnell, 1929–1932
*James H. Fleming, 1932–1935
Arthur C. Bent, 1935–1937
Herbert Friedmann, 1937–1939
James P. Chapin, 1939–1942
James L. Peters, 1942–1945
Hoyes Lloyd, 1945–1948
Robert Cushman Murphy, 1948–1950
Josselyn Van Tyne, 1950–

Vice-Presidents

*Elliott Coues, 1883–1890
*Robert Ridgway, 1883–1891; 1895–1898
*William Brewster, 1890–1895
*H. W. Henshaw, 1891–1894; 1911–1918
*C. Hart Merriam, 1894–1900
*Charles B. Cory, 1898–1903
Charles F. Batchelder, 1900–1905
*E. W. Nelson, 1903–1908
*Frank M. Chapman, 1905–1911
*A. K. Fisher, 1908–1914
*Witmer Stone, 1914–1920
*George Bird Grinnell, 1918–1923
*Jonathan Dwight, 1920–1923
Alexander Wetmore, 1923–1926
*Joseph Grinnell, 1923–1929
*James H. Fleming, 1926–1932
Arthur C. Bent, 1929–1935
Herbert Friedmann, 1932–1937
James P. Chapin, 1935–1939
James L. Peters, 1937–1942
*George Willett, 1939–1945
Hoyes Lloyd, 1942–1945
Robert Cushman Murphy, 1945–1948
Josselyn Van Tyne, 1945–1950
Alden H. Miller, 1948–
Ludlow Griscom, 1950–

Secretaries

*C. Hart Merriam, 1883–1889
*John H. Sage, 1889–1917
T. S. Palmer, 1917–1937
Lawrence E. Hicks, 1937–1946
Olin Sewall Pettingill, Jr., 1946–

Treasurers

*C. Hart Merriam, 1883–1885
*Charles B. Cory, 1885–1887
*William Dutcher, 1887–1903
*Jonathan Dwight, 1903–1920
W. L. McAtee, 1920–1938
Rudyerd Boulton, 1938–1942
*J. Fletcher Street, 1942–1944
Frederick C. Lincoln, 1944–1948
R. Allyn Moser, 1948–

Editors of 'The Auk'

*J. A. Allen, 1883–1911
*Witmer Stone, 1911–1936
*Glover M. Allen, 1936–1942
John T. Zimmer, 1942–1948
Harvey I. Fisher, 1948–

* Deceased

Patrons, Fellows, Members, and Associates of the American Ornithologists' Union, October, 1950

Patrons

Deane, Mrs. Ruthven, 830 Hibbard Rd., Winnetka, Illinois.....(1935) 1935
Lloyd, Hoyes, 582 Mariposa Ave., Rockcliffe Park, Ottawa, Ontario, Canada (1916)..... 1945
McIlhenny, Edward Avery (deceased)..... 1945
Merriam, Clinton Hart (Founder—deceased)..... 1937
Stone, Mrs. Witmer (deceased)..... 1940
Stoner, Mrs. Dayton, 399 State St., Albany, New York.....(1944) 1946
Wharton, William Pickman, Groton, Massachusetts.....(1907) 1945

Honorary Fellows

Bannerman, David Armitage, 120 Rivermead Court, Hurlingham, London, S. W. 6, England.....(1916) 1941[2]
Berlioz, Jacques, Museum d'Histoire Naturelle, 55 Rue de Buffon, Paris, France.....(1923) 1938
Falla, Robert Alexander, Dominion Museum, Wellington, New Zealand.....(1937) 1949
Ghigi, Alessandro, Direttore del Laboratorio de Zoologia applicata alla Caccia, Via S. Giacomo, 9, Bologna, Italy.....(1921) 1949
Gyldenstolpe, Nils (Carl Gustaffersen), Naturhistoriska Riksmuseum, Vetenskapskademien, Stockholm 50, Sweden.....(1918) 1934
Haagner, Alwin Karl, Caixa Postal 395, Beira, Portuguese E. Africa (1916) 1918
Kinnear, Norman Boyd, British Museum (Natural History), Cromwell Rd., London, S. W. 7, England.....(1931) 1934
Kuroda, Nagamichi, Fukuyoshi Cho, Akasaka, Tokyo, Japan.....(1918) 1921
Lack, David, Edward Grey Institute of Field Ornithology, 91 Banbury Rd., Oxford, England.....(1939) 1946
Meinertzhagen, Richard, 17 Kensington Park Gardens, London, W. 11, England.....(1916) 1928
Moreau, R[eginald] E[rnest], The Yews, Berrick, near Benson, Oxon., England.....(1938) 1949
Palmgren, Pontus, Zoologiska Museet, N. Jarnvagsgatan 13, Helsingfors, Finland.....(1932) 1946
Pinto, Olivério Mário de Oliveira, Department of Zoology, Bureau of Agriculture, São Paulo, Brazil.....(1940) 1945
Stresemann, Erwin, Zoological Museum, Universität, Invalidenstr. 43, Berlin No. 4, Germany.....(1922) 1930

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[1] By order of the Council names are given in full. Members are requested to advise the Treasurer, Dr. R. A. Moser, R.R. No. 1, Omaha 4, Nebraska, regarding incomplete or incorrect names or addresses or changes of address.

Only those elected by October, 1950, are included here, except for student memberships granted for 1951.

[2] Date in parentheses indicates year of joining the Union; date not in parentheses indicates year of election to status indicated.

Symbols in left margin are as follows: F = Fellow; M = Member; L = Life; H = Honorary; and E = Emeritus.

CORRESPONDING FELLOWS

ALEXANDER, WILFRID BACKHOUSE, Edward Grey Institute of Field Ornithology, 91 Banbury Rd., Oxford, England..... 1921
ALI, SÁLIM A., 33 Pali Hill, Bombay Suburban District, Bandra, India..... 1944
ALFARO, DON ANASTASIO, San José, Costa Rica..... 1888
APOLINAR MARÍA, HERMANO, Instituto de la Salle, Bogotá, Colombia..... 1921
BATE, MISS DOROTHEA MINOLA ALICE, British Museum (Natural History), Cromwell Rd., London, S. W. 7, England..... 1920
BAXTER, MISS EVELYN VIDA, The Grove, Kirkton of Largo, Fifeshire, Scotland 1919
BEAUFORT, LIEVEN FERDINAND DE, Zoological Museum, Amsterdam, Holland 1926
BELCHER, CHARLES FREDERIC, Kinangop, Kenya, British East Africa..... 1934
BERTONI, ARNOLDO DE WINKELREID, Puerto Bertoni, Paraguay..... 1919
BRYANT, CHARLES ERNEST WILLIAM, 394–396 Collins St., Melbourne, Australia..... 1949
CHIGI, FRANCESCO, Castel Fusano, Rome, Italy..... 1932
CHISHOLM, ALEXANDER HUGH, Daily Telegraph, Sydney, New South Wales. 1922
DAVID-BEAULIEU, ANDRÉ, Chateau Coutet, Saint-Émilion (Gironde), France 1949
DE LAVALLE, JOSÉ ANTONIO, Lima, Perú..... 1925
DEMENTIEV, GEORGES, Zoological Museum, Moscow Government University, Moscow 9, U. S. S. R..... 1934
DOMANIEWSKI, JANUSZ WITOLD, Polish Zoological Museum, Krakowskie-Przedmiescle 26, Warsaw, Poland..... 1926
DROST, RUDOLF, 6231 Wilhelmshaven, British Zone, Germany..... 1934
DUPOND, CHARLES, Square Prince Charles 21, Bruxelles-Laeken, Belgium.... 1932
ENGELBACH, PIERRE, 64 rue Saint-Denis, Colombes (Seine), France..... 1949
GRANT, CLAUDE HENRY BAXTER, 58-A Ennismore Gardens, London, S. W. 7, England..... 1920
GROEBBELS, FRANZ, Physiologischer Institut Krankenhaus, Hamburg-Eggendorf, Germany..... 1933
GROTE, HERMAN, Treudelenburgstrasse 17, Berlin-Charlottenburg, Germany 1923
HACHISUKA, MASAUJI, Mita Shiba, Tokyo, Japan.....(1927) 1930
HAVERSCHMIDT, FRANÇOIS, Box 644, Paramaribo, Surinam, Dutch Guiana.....(1928) 1950
HENSON, HARRY VERNON, c/o Hong Kong and Shanghai Banking Corporation, 9 Grace Church St., London E. C., England..... 1888
HINDWOOD, K. A., Wingello House, Angel Pl., Sydney, New South Wales, Australia..... 1938
HUXLEY, JULIAN SORRELL, Zoological Society of London, Regent's Park, N. W. 8, London, England..... 1941
INGRAM, COLLINGWOOD, The Grange, Benenden, Cranbrook, Kent, England. 1920
IREDALE, TOM, c/o Australian Museum, Sydney, New South Wales, Australia 1918
JUNGE, G. C. A., Rijsmuseum van Naturlijke Historie, Leiden, Netherlands 1939
LAUBMANN, ALFRED, Zoölogisches Staatssammlung, Neuhauser-str. 51, Munich, Germany..... 1923
LORENZ, KONRAD, P. Greifenstein, Altenberg, Germany..... 1938
MACDONALD, JAMES DAVID, British Museum (Natural History), Cromwell Rd., London S. W. 7, England..... 1949
MATTINGLEY, ARTHUR HERBERT EVELYN, 42 Canterbury Rd., Camberwell, Melbourne, Victoria, Australia..... 1921
MAYAUD, NOEL, 36 Rue Hoche, Saumur, Maine-et-Loire, France..... 1949

MEISE, WILHELM, Museum für Tierkunde, Ostra Allee, Dresden, Germany.. 1938
MOFFETT, LACY IRVINE, Kiangyin Ku, China..... 1919
MOLTONI, EDGARDO, Palazza del Museo Civico, Corso Venezia 55, Milano, Italy..... 1936
MOMIYAMA, TOKU TARO, 1146 Sasazka, Yoyohata-mati, Tokyo, Japan..... 1925
OLIVER, WALTER REGINALD BROOK, 26 Ventnor St., Seatown, Wellington, E. 5, New Zealand..... 1923
PONCY, ROBERT, Lachenal 19, Geneva, Switzerland..... 1932
RAMSDEN, CHARLES T[HEODORE], 8 y 19 Vista Alegre, Santiago, Cuba. (1912) 1918
RENSCH, BERNHARD, Zoölogisches Museum, Invalidenstr. 43, Berlin 4, Germany..... 1932
RICHDALE, LANCELOT E[RIC], 23 Skibo St., Kew, Dunedin, S. W. 1, New Zealand.....(1943) 1947
RINTOUL, MISS LEONORA JEFFREY, Lahill, Largo, Fifeshire, Scotland..... 1919
SALOMONSEN, FINN, Zoologisk Museum, Krystalgade, Copenhagen K. Denmark..... 1949
SASSI, MORIZ, Naturhist. Museum, Burgring 7, Vienna 1, Austria..... 1934
SCHAANNING, HANS THOMAS LANGE, Stavanger Museum, Stavanger, Norway 1923
SCHOUTEDEN, H., Musée du Congo Belge, Tervueren, Belgium..... 1934
SCHÜZ, ERNST, Vogelwarte Rossitten Kurische Nehrung, Ostpreussen, Germany..... 1938
SERVENTY, D[OMINICK] L., 27 Everett St., Nedlands, West Australia..... 1949
SETH-SMITH, DAVID, Zoological Gardens, Regent's Park, London, N. W. 8, England..... 1920
SKOVGAARD, PETER, Skovbo, pres Viborg, Denmark..... 1926
STEGMANN, BORIS CHARLES, Zoological Museum, Academy of Science, Leningrad, U. S. S. R..... 1932
STONEHAM, H[UGH] F[REDERIC], Stoneham Museum and Research Centre, Kitale, Kenya Colony, British East Africa.....(1928) 1930
TAKA-TSUKASA, NOBUSUKA, 1732 Sanchome, Kami-meguro, Meguro-ku, Tokyo, Japan..... 1924
THOMSON, ARTHUR LANDSBOROUGH, 16 Tregunter Rd., London, S. W. 10, England..... 1922
TICEHURST, NORMAN FREDERIC, 24 Pevensey Rd., St. Leonards-on-sea, Sussex, England..... 1918
TINBERGEN, NIKO, Department of Zoology, University Museum, Oxford, England..... 1938
UCHIDA, SEINOSUKE, No. 1, 7-chome, Aoyama, Kitamachi, Tokyo, Japan... 1919
VAN SOMEREN, VICTOR GURNET LOGAN, Box 658, Nairobi, Kenya Colony, British East Africa..... 1921
VINCENT, JACK, "Firle," Mooi River, Natal, South Africa..... 1949
WAGNER, HELMUTH O., Museum für Natur-, Völker-, und Handelskunde, Bahnhofsplatz, Bremen 1, Germany.....(1945) 1950
WHITE, SAMUEL ALBERT, Wetunga, Fulham, South Australia..... 1919
YAMASHINA, YOSHIMARO, Yamashina Museum, 49 Nampeidai-machi, Shibuya-ku, Tokyo, Japan..... 1949

FELLOWS, MEMBERS, AND ASSOCIATES

ABBOTT, CYRIL E[DWARD], 1322 E. Colfax Ave., Denver 6, Colorado..... 1934
ABBOTT, MRS. DOROTHY COWGILL, 74 Federal St., Brunswick, Maine..... 1950
ABBOTT, JACKSON MILES, 814—13th St., New Alexandria, Virginia..... 1946

ABDULALI, HUMAYUN, Faiz & Co., 75 Abdul Rehman St., Bombay 3, India 1946
ABRAITYS, VINCENT [VALENT], Sergeantsville, New Jersey 1950
L ACHILLES, MRS. GERTRUDE S., Morgan Hill, California 1925
ADAMS, HERBERT GERALD, 730 S. W. St. Clair Ave., Portland 5, Oregon .. 1943
ADAMS, I. C., JR., Box 158, Columbia, Missouri 1939
ADAMS, IVERS S[HEPARD], Hardwick, Massachusetts 1938
ADAMS, MISS LETA EMMA, c/o Mrs. A. W. Tower, 712 Portola Ave., Glendale 6, California 1946
ADAMS, LOWELL, Forest Experiment Station, Missoula, Montana 1947
ADAMS, WILLIAM HENSLEY, JR., 1516 Ferguson Ave., Nashville 4, Tennessee 1949
ADAMS, W[ILLIAM] R[ICHARD], Laboratory of Comparative Osteology, 707 Anita St., Bloomington, Indiana 1950
ADAMSON, MRS. M. H. [RHODA R.], 355 Muirfield Rd., Los Angeles 5, California 1949
ADDY, C[HARLES] E[DWARD], 56 Spofford St., Newburyport, Massachusetts 1938
ADELSON, RICHARD, 34 Wensley Dr., Great Neck, Long Island, New York 1937
AGGEN, JOHN C., R. R. No. 1, Morrison, Illinois 1947
F ALDRICH, JOHN W[ARREN], Fish and Wildlife Service, Department of the Interior, Washington 25, D. C. ..... (1929) 1947
ALEXANDER, DONALD C[HILD], 16 Pleasant St., Nahant, Massachusetts .. 1936
ALEXANDER, [EDWARD] GORDON, Department of Biology, University of Colorado, Boulder, Colorado 1939
ALEXANDER, KENNETH FREDERICK COCHRANE, Port Graves, Gambier Island via Horseshoe Bay, British Columbia, Canada 1937
ALEXANDER, R[OBERT] C[AMPBELL], 19207 Charleston Ave., Detroit, Michigan 1942
ALLAN, ALEXANDER, 9225—96 St., Edmonton, Alberta, Canada 1949
ALLAN, PHILIP F[ARLEY], 1801 Carleton, Ft. Worth, Texas 1931
ALLARD, H[ARRY] [ARDELL], 3000—7th St., N., Arlington, Virginia 1929
ALLEE, W[ARDER] C[LYDE], 114 Leigh Hall, University of Florida, Gainesville, Florida 1940
F ALLEN, ARTHUR A[UGUSTUS], Fernow Hall, Cornell University, Ithaca, New York ..... (1909) 1922
ALLEN, MRS. DEAN H., 16 McKinley St., Montpelier, Vermont 1950
ALLEN, MISS ESTHER C[AMPBELL], Camarillo State Hospital, Camarillo, California 1949
M ALLEN, ELSA G[UERDRUM], [MRS. ARTHUR AUGUSTUS], Cornell University, Ithaca, New York ..... (1935) 1947
F ALLEN, FRANCIS HENRY, 9 Francis Ave., Cambridge 38, Massachusetts ..... (1888) 1947
M ALLEN, ROBERT PORTER, Tavernier, Florida ..... (1933) 1944
ALLEN, MISS SUSAN J[ANNEY], "Sunnybrae," Box 467, Milford, Delaware 1949
ALLEN, WALTER FOX, 93 Maplewood Ave., Maplewood, New Jersey 1925
ALLIN, DR. ALBERT E[LLIS], Provincial Health Laboratory, Fort William, Ontario, Canada 1939
ALLISON, SIDNEY J[OB], 58 Alfreton Rd., Nottingham, England 1950
ALMENDINGER, WILLIAM H., 15 Niagara St., Buffalo 2, New York 1949
ALMON, LOIS, State Teachers College, Eau Claire, Wisconsin 1948
ALPERIN, IRWIN M., 2835 Ocean Ave., Brooklyn 35, New York 1939
ALTEMUS, DONALD R[ICHARD], 120 Stewart St., Freeport, Pennsylvania .. 1949

F AMADON, DEAN, American Museum of Natural History, Central Park West at 79th St., New York 24, New York.....(1930) 1949
AMES, OAKES I[NGALLS], 7 Meadow Way, Cambridge 38, Massachusetts. 1950
AMES, MISS ROSELLA S[PRAGUE], Moraine St., Marshfield, Massachusetts 1940
AMES, DR. STANLEY R[ICHARD], 61 Biltmore Dr., Rochester 17, New York 1948
AMIDON, MRS. HILDA F[ARNUM], 282 Sigourney St., Hartford 5, Connecticut..... 1950
M ANDERSON, ANDERS HAROLD, 3221 Kleindale Rd., Tucson, Arizona (1939) 1950
ANDERSON, MRS. ARVID, 3518 Dawes St., Madison 4, Wisconsin..... 1949
ANDERSON, CHARLES H., 1015 Connely Dr., Salinas, California..... 1949
ANDERSON, DANA, c/o The Chickadee Workshop, St. Edward, Nebraska.. 1947
ANDERSON, EARL A[XEL], 7335 N. Odell Ave., Chicago 31, Illinois..... 1950
ANDERSON, FRANK C., Beech and Woodland Ave., Louisville 11, Kentucky 1948
ANDERSON, G[EORGE] ARTHUR, 601 E. Wapello St., Altadena, California 1949
ANDERSON, DR. GEORGE EDWIN, 408 Shearer Bldg., Bay City, Michigan. 1939
ANDERSON, JOHN M., Winous Point Club, Port Clinton, Ohio..... 1938
ANDERSON, MRS. MAE [HATFIELD], Box 382, Empire, Oregon..... 1950
ANDERSON, ROY, c/o A. Brox, Camrose, Alberta, Canada..... 1942
M ANDERSON, RUDOLPH M[ARTIN], 58 Driveway, Ottawa, Ontario, Canada.....(1907) 1914
ANDREWS, ARTHUR ALLEN, 75 Penfield Crescent, Brighton Station, Rochester, New York..... 1924
ANDREWS, G[EORGE] MALCOLM, 1949 Wabash Ave., Schenectady 6, New York..... 1943
ANDREWS, DR. JAMES M., 4860 Linnaean Ave., N. W., Washington 8, D. C. 1943
ANDREWS, MRS. LYDIA G[OEHMANN], 513 E. Sixth St., Erie, Pennsylvania 1949
ANDREWS, SARA BACHE [MRS. CHARLES B.], 20 Main St., Clinton, New Jersey..... 1947
ANGLIN, JAMES P., 957 Dunsmuir Rd., Town of Mount Royal, Quebec, Canada..... 1943
ANNAN, ORMSBY, 1059 Chatfield Rd., Winnetka, Illinois..... 1950
ANTEVS, MRS. ADA, The Corral, Globe, Arizona..... 1947
ANTHES, CLARENCE A[LVIN], 713 Hamilton Ave., Waukesha, Wisconsin.. 1937
ANTHONY, HOWARD E[DWARD], c/o Heath Company, Benton Harbor, Michigan..... 1949
ANTONIAZZI, JOHN F[RANCIS], 397 Westford Dr., Southport, Connecticut.. 1950
APPEL, THOMAS G., 63 Sunnyside Ave., Pleasantville, New York..... 1931
APPLEBERRY, C[ECIL] M[ARTIN], SR., 5 Lake Forest Parkway, Wilmington, North Carolina..... 1948
APPLEBERRY, MRS. EDNA LANIER, 5 Lake Forest Parkway, Wilmington, North Carolina..... 1947
APPLEGATE, MRS. RUTH S[IBLEY], R. R., Rockfall, Connecticut..... 1950
APPLEGATE, WILSON G. HUNT, Rhinebeck, New York..... 1934
ARBIB, ROBERT S[IMEON], JR., 231 W. Lena Ave., Freeport, New York... 1947
ARCHBOLD, RICHARD, American Museum of Natural History, Central Park West at 79th St., New York 24, New York..... 1930
ARDAPPLE, MRS. CLARENCE [MARY JANE], R. R. No. 1, Morrison, Illinois 1949
ARGUE, ARTHUR W., 1040 Boylston St., Boston, Massachusetts..... 1946
ARMITT, H[ERBERT] T[HOMAS], 102 Orange Ave., East Paterson, New Jersey..... 1950

ARMSTRONG, NANCY V[ICTORINE] [MRS. W. J.], 15 Willow Ave., Westmount, Montreal 6, Quebec, Canada 1949
ARMSTRONG, MISS VIRGINIA, Musketaquid Rd., Concord, Massachusetts 1937
ARNETT, JOHN HANCOCK, JR., 6200 Ardleigh St., Germantown, Philadelphia 38, Pennsylvania 1946
ARNOLD, ELTING, 514 Dorset Ave., Chevy Chase 15, Maryland 1934
L ARNOLD, EDWARD WILLIAM CAMERON, Cedar Swamp Rd., Glen Head, New York 1929
ARNOLD, LEE W[EIGHT], Waubay National Wildlife Refuge, Waubay, South Dakota 1949
ARNOLD, MRS. MARION LOUISE, R. R. No. 2, Aylmer West, Ontario, Canada 1947
ARNY, SAMUEL ANDREW, 1425 Drehr Ave., Baton Rouge, Louisiana 1951
ARONOFF, ARTHUR EDWARD, 59 W. 71st St., New York, New York 1947
ARVEY, M[ARTIN] DALE, Department of Zoological Sciences, University of Oklahoma, Norman, Oklahoma 1949
ASHTON, RANDOLPH, 800 Crown St., Morrisville, Pennsylvania 1938
ATCHESON, JOHN G[ERALD], JR., "Guildcroft," R. R. No. 2, Pickering, Ontario, Canada 1948
ATKINS, ELISHA, 538 Warder Ave., University City 24, Missouri 1946
ATSATT, SARAH R., 405 Hilgard Ave., Los Angeles 24, California 1947
ATWOOD, EARL L[EROY], 6 Woodland Ave., Takoma Park, Maryland 1948
AUCHINCLOSS, BAYARD C[UTTING], 1711 Guilford Lane, Oklahoma City, Oklahoma 1949
AUGUSTSON, G. F., 315 S. "J" St., Madera, California 1947
AUSTIN, MRS. ENID K., 1116 Mandana Blvd., Oakland 10, California 1947
AUSTIN, JOHN BRANDER, 9 Chamonix Rd., St. Davids, Pennsylvania ... 1947
AUSTIN, DR. J. HAROLD, 9 Chamonix Rd., St. Davids, Pennsylvania ... 1942
F AUSTIN, OLIVER LUTHER, JR., Tuckahoe, New York .....(1925) 1948
M AUSTIN, DR. OLIVER LUTHER, SR., Tuckahoe, New York .....(1930) 1940
AUSTING, GEORGE RONALD, 6801 Marvin Ave., North College Hill 31, Ohio 1947
AVERITT, MAX WADE, Service Club 50, APO 929, c/o P. M., San Francisco, California 1950
AVERY, MRS. HELEN G[OULD], 160 Wellington St., Springfield, Massachusetts 1948
AXTELL, HAROLD H[AMILTON], Buffalo Museum of Science, Buffalo 11, New York 1941
AYER, MRS. N[ATHAN] EDWARD, 1300 Hillcrest Dr., Pomona, California .. 1924
AYLWARD, DAVID A[RCHIE], 20 Spruce St., Boston 8, Massachusetts 1948
AYRES, CHARLES C., JR., 922 N. Greene St., Ottumwa, Iowa 1944
BACKUS, EDGAR, 45 Queens Rd., Clarendon Park, Leicester, England 1950
BACON, BRASHER COLLINS, SR., Spring Lake Wildlife Refuge, Madisonville, Kentucky 1948
BACON, FRANCIS L[LEWELLYN], 22 Waterman Ave., Philadelphia 18, Pennsylvania 1917
BAECHLE, JOHN WILLARD, St. Joseph's College, Collegeville, Indiana 1946
BAER, MISS MYRTLE W., 1237 N. Jefferson St., Milwaukee, Wisconsin 1942
BAERG, WILLIAM J., College of Agriculture, University of Arkansas, Fayetteville, Arkansas 1924
BAGG, AARON MOORE, 72 Fairfield Ave., Holyoke, Massachusetts 1946

F BAILEY, ALFRED M[ARSHALL], Colorado Museum of Natural History, Denver, Colorado.....(1918) 1941
L BAILEY, JOHN WENDELL, 27 Willway Rd., Richmond 21, Virginia..... 1925
M BAILLIE, JAMES L[ITTLE], JR., Royal Ontario Museum of Zoology, 100 Queen's Park, Toronto 5, Ontario, Canada.....(1923) 1935
BAILY, FISHER C., 1229 Ralston St., Reno, Nevada..... 1947
BAIRD, JAMES, 14 Haydn St., Roslindale, Massachusetts..... 1947
BAKER, B[ERNARD] W., R. R. No. 1, Judson Rd., Spring Lake, Michigan.. 1938
BAKER, ELEANOR H. [MRS. BRADLEY L.], R. R. No. 3, Concord, New Hampshire..... 1950
M BAKER, JOHN HOPKINSON, 1165—5th Ave., New York, New York..(1911) 1949
BAKER, PAUL S., 5545 Stonegate Dr., Dallas, Texas..... 1944
M BAKER, ROLLIN H[AROLD], Museum of Natural History, University of Kansas, Lawrence, Kansas.....(1939) 1950
BAKER, ROSS STEWART, 5 Bain Ave., Toronto 6, Ontario, Canada..... 1946
BAKER, WILLIAM CALVIN, 559 Euclid St., Salem, Ohio..... 1930
BALCH, FRANCIS N[OYES], 130 Prince St., Jamaica Plain, Massachusetts.. 1946
BALDWIN, MRS. HARRY LEVERETT, 6335 Kimbark Ave., Chicago 37, Illinois..... 1924
BALDWIN, PAUL H., Department of Zoology, Colorado A. and M. College, Fort Collins, Colorado..... 1947
BALDWIN, WILLIAM P[LEWS], JR., c/o Savannah National Wildlife Refuge, Port Wentworth, Georgia..... 1937
BALL, MISS A. ELIZABETH, 20 Mansfield Pl., Rutland, Vermont..... 1947
BALL, MISS GRACE E., 165 Eldridge St., Mill Valley, California..... 1948
BALL, KATHLEEN E., Department of Entomology, Comstock Hall, Cornell University, Ithaca, New York..... 1946
BALL, ROBERT E[DWIN], 2622 Tuscarawas St., W., Canton, Ohio..... 1938
BALL, STANLEY C[RITTENDEN], Peabody Museum of Natural History, New Haven, Connecticut..... 1942
BALL, WILLIAM HOWARD, 5818—30th Ave., Hyattsville, Maryland..... 1923
BALSOM, MRS. AMOS P., 2209 E. Stratford Court, Milwaukee 11, Wisconsin 1947
BANCROFT, MISS CONSTANCE J[ORDAN], Indian Mountain School, Lakeville, Connecticut..... 1947
BARBER, D[AVID] H[ENRY], The Rectory, Mells, near Frome, Somerset, England..... 1948
BARBER, YATES MIDDLETON, JR., 7 Lee Dr., Lake Forest, Wilmington, North Carolina..... 1948
BARBOUR, LLEWELLYN P[HELPS], 94 Wood St., Willoughby, Ohio..... 1949
BARBOUR, ROGER W., Department of Zoology, University of Kentucky, Lexington, Kentucky..... 1937
BARD, FRED GEORGE, Provincial Museum, Normal School, Regina, Saskatchewan, Canada..... 1947
BARDEN, DR. CORA E., 10 Mason St., Brunswick, Maine..... 1950
BARKALOW, FREDERICK S[CHENCK], JR., Box 5215, State College Station, Raleigh, North Carolina..... 1938
BARNARD, ELLSWORTH, Shelburne Falls, Massachusetts..... 1949
BARNES, CHARLES K[NAPP], 2026 Lincoln Way, South Bend 19, Indiana.. 1946
HL BARNES, CLAUDE TEANCUM, 359 Tenth Ave., Salt Lake City, Utah..... 1908
BARNES, MRS. RUTH, 173 Myrtle St., Shelton, Connecticut..... 1944

BARNES, WILLIAM B., Indiana Department of Conservation, 311 W. Washington St., Indianapolis 9, Indiana 1947
BARRETT, CHARLES H[ORATIO] M[ATCHETT], 1339 Valley Pl., S. E., Washington, D. C. 1912
BARRY, EDWIN MCCORMICK, Epping Forest, R. R. No. 1, Annapolis, Maryland 1942
BARRY, GEORGE R[AYMOND], 928 Gallia St., Portsmouth, Ohio 1949
BARTEL, KARL E[MIL] [EDGAR], 2528 W. Collins St., Blue Island, Illinois .. 1934
M BARTHOLOMEW, GEORGE A[DELBERT], JR., Department of Zoology, University of California, Los Angeles 24, California ..... (1941) 1949
BARTL, ROBERT LA SALLE, 1309 Gallatin St., N. W., Washington 11, D. C.. 1947
BARTLETT, CHARLES O[MAR], Department of Wildlife Management, 424 University Farm Pl., Madison 6, Wisconsin 1950
BARTLETT, GUY, 1053 Parkwood Blvd., Schenectady 8, New York 1932
BARTMAN, G[EORGE] MARSHALL, 135 Deloraine Ave., Toronto, Ontario, Canada 1947
BARTOW, TYRA C. [MRS. LESLIE W.], 6515 S. W. Burlingame Ave., Portland 1, Oregon 1950
BARTRAM, EDWIN B[UNTING], Bushkill, Pike County, Pennsylvania 1913
M BARTSCH, PAUL, Lebanon, Gunston Hall Rd., Norton, Virginia .... (1896) 1902
BASKETT, THOMAS S[EBREE], Missouri Cooperative Wildlife Research Unit, Wildlife Conservation Bldg., University of Missouri, Columbia, Missouri 1946
BASNER, HARRY, Mountaindale, New York 1927
BASSETT, ANNA STOWELL [MRS. VICTOR HUGO], 1010 East Park Ave., Savannah, Georgia 1927
F BATCHELDER, CHARLES FOSTER, 7 Kirkland St., Cambridge, Massachusetts ..... (Founder)
BATCHELDER, MRS. CHARLES FOSTER [LAURA P.], 7 Kirkland St., Cambridge, Massachusetts 1930
BATES, C[YRIL] D[AWSON], Box 600, Dauphin, Manitoba, Canada 1948
BATES, CURTIS E., 609 Elm St., Rome, New York 1946
BATTELL, MISS HARRIET C., Cedar Hollow Rd., c/o Quam, Paoli, Pennsylvania 1948
L BATTS, H[ENRY] LEWIS, JR., 1211 Glenwood Ave., Kalamazoo, Michigan. 1948
BAUGH, MISS BIRDIE MAY, Birdland Farm, Belona, Virginia 1947
BAUMGARTNER, FREDERICK M[ILTON], Department of Zoology, Oklahoma A. & M. College, Stillwater, Oklahoma 1930
M BAUMGARTNER, MARGUERITE HEYDWEILLER [MRS. FREDERICK M[ILTON]], R. R. No. 2, Stillwater, Oklahoma ..... (1930) 1945
BAXTER, MISS DOROTHEA MCV[ICKAR], 255 Liberty Ave., Westbury, Long Island, New York 1950
BAXTER, WILLIAM, 1011 Trenton Pl., Wilmington, Delaware 1950
BAYLESS, MRS. ANNE D[OUGLAS], 7200 Coles Ave., Apt. 112, Chicago 49, Illinois 1950
BAYNARD, OSCAR E., Box 124, Plant City, Florida 1944
BEACHAM, [EDWARD] DEREK, 238 Wineva Ave., Toronto 8, Ontario, Canada 1948
BEADEL, HENRY LUDLOW, R. R. No. 1, Tallahassee, Florida 1926
BEALS, EDWARD [WESLEY], Scattergood School, West Branch, Iowa 1950
BEAMER, LLOYD HENRY, Box 56, Meaford, Ontario, Canada 1935

BEARD, ELIZABETH B[ROWNE] [MRS. ALLEN S[HELBY]], 9904 Berwick Rd., Rosedale Gardens, Plymouth, Michigan..... 1942
BEARD, MRS. T. C. [DOROTHY], Box 152-A, R. R. No. 3, Mound, Minnesota 1946
BEARDSLEE, CLARK SMITH, 132 McKinley Ave., Kenmore, New York... 1930
BEARDSLEY, MISS M[ARGARET] HORTENSE, 410 South Prospect St., Ravenna, Ohio..... 1941
BEASLEY, RAY J[ACKSON], 3939 Stokes Dr., Baltimore 29, Maryland.... 1947
BEATON, ROBERT JOHN, 228 Webster St., N. E., Washington 11, D. C. 1948
BEATTY, ROBERT OWEN, Izaak Walton League of America Inc., 31 N. State St., Chicago, Illinois..... 1946
BECK, HERBERT HUEBENER, 515 N. President Ave., Lancaster, Pennsylvania..... 1931
BECKLEY, HENRY, 277 Douglas Ave., Springfield, Ohio..... 1947
L BEDELL, LAUREL MAY [MRS. HARRY M.], 1620 Massachusetts Ave., N. W., Washington 6, D. C..... 1929
F BEEBE, [CHARLES] WILLIAM, 33 West 67th St., New York, New York(1897) 1912
M BEECHER, WILLIAM J[OHN], Chicago Natural History Museum, Roosevelt Rd. and Field Dr., Chicago 5, Illinois.....(1937) 1950
BEER, JAMES R[OBERT], Division of Entomology and Economic Zoology, University of Minnesota, St. Paul 1, Minnesota..... 1939
BEGUE, WILLIAM J[OHN], JR., 1228 S. Maple Ave., Berwyn, Illinois..... 1950
M BEHLE, WILLIAM H[ARROUN], Department of Biology, University of Utah, Salt Lake City, Utah.....(1934) 1941
BEIDLEMAN, RICHARD G[OOCH], Zoology Department, Colorado A. and M. College, Fort Collins, Colorado..... 1948
BELCHER, PAUL EUGENE, 988 Jefferson Ave., Akron, Ohio..... 1937
BELDEN, ROBERT F[ITCH], 3 Kellogg St., Windsor, Connecticut..... 1950
BELDING, JOHN C[LINTON], 63 Washington Ave., Northampton, Massachusetts..... 1949
BELGER, CLARENCE ALBERT, 1528 Gwinnett St., Augusta, Georgia..... 1947
L BELKNAP, JOHN BALCOM, 96 Clinton St., Gouverneur, New York..... 1927
BELL, FRANK D[URHAM], Mondamin, Tuxedo, North Carolina..... 1948
BELL, GLENN W., 115 Willowwood Circle, S. E., Atlanta, Georgia..... 1947
M BELLROSE, FRANK, JR., 334 E. Adams St., Havana, Illinois.....(1934) 1947
L BELT, CHARLES BANKS, 233 Broadway, New York 7, New York..... 1950
BELT, DR. ELMER, 1893 Wilshire Blvd., Los Angeles 5, California..... 1950
BELTON, WILLIAM, Secretary at Ciudad Trujillo, Department of State, Washington 25, D. C..... 1947
BEMONT, DONALD R[OLAND], 314 Spencer Rd., Ithaca, New York..... 1950
BENCHLEY, MRS. BELLE J[ENNINGS], Box 551, Zoological Society of San Diego, San Diego 12, California..... 1950
BENCKENSTEIN, MRS. EUNICE R[OBINSON], Box 720, Orange, Texas..... 1949
BENCKESER, HAROLD R., Box 177, Brule, Nebraska..... 1947
BENJAMIN, GILBERT, JR., Apt. 102, 2107 Hildarose Dr., Silver Spring, Maryland..... 1947
BENNETT, CHA[RLE]S H[ERBERT], 80 Belmont Ave., Ottawa, Ontario, Canada..... 1948
BENNETT, HAROLD EBENEZER, 1515 Burton St., Rockford, Illinois..... 1947
M BENNETT, LOGAN J[OHNSON], Fish and Wildlife Service, Department of the Interior, Washington 25, D. C.....(1934) 1946
BENNETT, WALTER WALDO, 5617 Harcourt Ave., Los Angeles, California.. 1924

BENSON, FRANK W[ESTON], 14 Chestnut St., Salem, Massachusetts..... 1920
BENSON, SETH B[ERTRAM], 645 Coventry Rd., Berkeley 7, California..... 1928
L,F BENT, ARTHUR CLEVELAND, 140 High St., Taunton, Massachusetts (1889) 1909
BENT, GEORGE PAYNE, 2nd., Lake Ave., Greenwich, Connecticut..... 1950
BENTON, ALLEN H[AYDON], New York College for Teachers, Albany, New York..... 1949
BERGER, ANDREW J[OHN], Department of Anatomy, East Medical Bldg., University of Michigan, Ann Arbor, Michigan..... 1948
BERGESON, W[ILLIAM] R[USSELL], Montana Fish and Game Department, Helena, Montana..... 1949
BERGMANN, WILLIAM E[DMUND], JR., 6719 Betts Ave., North College Hill 24, Ohio..... 1950
BERGSTROM, E[DWARD] ALEXANDER, 37 Old Brook Rd., W. Hartford 7, Connecticut..... 1939
BERKEY, GLENN L[EROY], 22 S. State St., Rittman, Ohio..... 1949
BERKOWITZ, ALBERT C[LARENCE], 517—58th St., Des Moines 14, Iowa.. 1948
BERLETT, EDWARD, Plattsmouth, Nebraska..... 1947
BERLINER, BENJAMIN C[LEMENS], 163 E. Rockaway Rd., Hewlett, New York..... 1949
BESSON, E[SAIE] JOHN, 1839 Ingleside Terrace, N. W., Washington, D. C. 1947
BESTON, HENRY, Chimney Farm, Nobleboro, Maine..... 1950
BEYER, FRANK KEMP, Department of Forestry, University of Maine, Orono, Maine..... 1948
BIAGGI, VIRGILIO, JR., Biology Department, College of Agriculture and Mechanic Arts, University of Puerto Rico, Mayaguez, Puerto Rico 1944
BIBBEE, PAUL CECIL, Athens, West Virginia..... 1947
L BIGELOW, MRS. ARCHIBALD PIERCE, 270 Wayne Ave., Oakland, California 1919
HL BIGELOW, HOMER LANE, The Farm, Windy Row, Peterborough, New Hampshire..... 1902
BIGGS, JOSEPH D[ANIEL], 6624 First St., N. W., Washington 12, D. C.... 1949
BILBY, HENRY ANTHONY, 2 Sunnyside Cottages, Harlington, Middlesex, England..... 1947
BILLINGS, WAYNE LEE, 227 Boston Ave., Waterloo, Iowa..... 1950
BINGHAM, MRS. HARRY P., JR., [LILLA FISK], Cove Rd., Oyster Bay, Long Island, New York..... 1949
BINGHAM, MILLICENT TODD, 1661 Crescent Pl., Washington 9, D. C..... 1949
BIRCH, ROBERT L[EE], Department of Biology, West Virginia University, Morgantown, West Virginia..... 1950
BIRD, DICK, 1849 Scarth St., Regina, Saskatchewan, Canada..... 1947
BIRD, HENRY LONSDALE, 27 McKeen St., Brunswick, Maine..... 1951
BIRDSEYE, CLARENCE, Eastern Point Blvd., Gloucester, Massachusetts.. 1948
BIRKELAND, HENRY, Roland, Iowa..... 1933
BISSELL, F[REDERICK] E., 1900 Plymouth St., Dubuque, Iowa..... 1949
BISWAS, BISWAMOY, Zoological Survey of India, Indian Museum, 27 Chowringhee, Calcutta 13, India..... 1948
BIVINS, STEPHEN T., Box 315, Milledgeville, Georgia..... 1946
BLACK, C[HARLES] THEODORE, Box 480, R. R. No. 1, East Lansing, Michigan..... 1933
HL BLACKWELDER, ELIOT, Box N, Stanford University, California..... 1895
L BLAIN, DR. ALEXANDER WILLIAM, 1028 Berkshire Rd., Grosse Pointe Park 30, Michigan..... 1902

M BLAKE, CHARLES HENRY, Lincoln, Massachusetts.....(1946) 1950
M BLAKE, EMMET R[EID], Chicago Natural History Museum, Roosevelt Rd. and Field Dr., Chicago 5, Illinois.....(1933) 1939
BLAKE, SIDNEY FAY, 2817—1st Rd., N., Arlington, Virginia..... 1923
BLANCHARD, HAROLD H[OOPER], 32 Calumet Rd., Winchester, Massachusetts..... 1939
BLAND, JOHN BROWNELL, 106 Ave. Camilo, Coral Gables 34, Florida.... 1948
BLANKENSHIP, LYTLE H[OUSTON], 300 Coffey Hall, University Farm, St. Paul 1, Minnesota..... 1949
L BLAUVELT, HIRAM B. D., 637 Kinderkamack Rd., Oradell, New Jersey.. 1948
BLEITZ, DONALD L., 5338 Hollywood Blvd., Hollywood, California..... 1947
BLINCOE, BENEDICT JOSEPH, 8766 N. Main St., Dayton 5, Ohio..... 1921
BLOCK, MELVIN L[EON], 435 E. Hudson St., Toledo 8, Ohio..... 1950
BLOSSOM, PHILIP M[OSS], 2422 E. Washington St., Pasadena 7, California 1948
BLOUCH, RALPH I[RVING], Box 123, R. R. No. 1, Okemos, Michigan..... 1949
BOGGS, OLIVER D., Imperial Oil Ltd., 300 Ninth Ave., W., Calgary, Alberta, Canada..... 1947
BOLDTMANN, JOHN KARL, 132 Lincoln St., Hackensack, New Jersey..... 1949
BOLTON, STANWOOD K[NOWLES], JR., Lexington Rd., Concord, Massachusetts..... 1949
BOND, GORMAN M[ORTON], 5414 Main St., Elkridge, Maryland..... 1939
BOND, HENRIETTA I. W. [MRS. FRANK], 3127 Newark St., N. W., Washington 8, D. C..... 1940
F BOND, JAMES, Academy of Natural Sciences, 19th and Race Sts., Philadelphia, Pennsylvania.....(1923) 1946
M BOND, RICHARD M[ARSHALL], 3322 S. W. Fairmount Blvd., Portland, Oregon.....(1939) 1945
BONNEY, CHRISTINE A. [MRS. GUY E.], General Delivery, Marathon, Florida..... 1949
BOOCOCK, PHILIP M. B., 53 Colvin Ave., Buffalo 16, New York..... 1946
BOOHER, MISS LELA E., Hotel Leamington, Minneapolis, Minnesota.... 1943
BOOTH, ERNEST S[HELDON], Department of Biology, Walla Walla College, College Pl., Washington..... 1946
BORDEN, RICHARD, 1031 Canton Ave., Milton, Massachusetts..... 1947
BORELL, A[DREY] E[DWIN], Soil Conservation Service, Albuquerque, New Mexico..... 1927
BORROR, DONALD J[OYCE], Department of Zoology and Entomology, Ohio State University, Columbus, Ohio..... 1936
BOTSFORD, MISS E. FRANCES, Connecticut College, New London, Connecticut..... 1947
M BOULTON, [WOLFRID] RUDYERD [JR.], 3317 Dent Pl., N. W., Washington 7, D. C.....(1915) 1929
BOURNE, NEIL, 39 Flatt Ave., Hamilton, Ontario, Canada..... 1947
BOURNE, RAYMOND D[ORY], 118 E. Vine St., Oxford, Ohio..... 1946
BOUSLOG, DR. JOHN SAMUEL, 304 Republic Bldg., Denver 2, Colorado... 1930
BOVEY, MARTIN K., Westford Rd., Concord, Massachusetts..... 1942
M BOWDISH, B[EECHER] S[COVILLE], Demarest, New Jersey.....(1891) 1934
HL BOWDISH, MRS. B[EECHER] S., [CHRISTABEL EVERETT], Demarest, New Jersey..... 1902
BOWEN, HARVEY L[EE], Willis Wharf, Virginia..... 1949
BOWEN, NORMAN, Box 36, Tiffin, Ohio..... 1948

BOWEN, RICHARD, 32 Underwood St., Fall River, Massachusetts..... 1947
BOWEN, ROBERT M[ARVIN], 5009 Leeds Ave., Halethorpe 27, Maryland.. 1947
M BOWEN, W[ILFRID] WEDGWOOD, Dartmouth College Museum, Hanover, New Hampshire.....(1926) 1931
BOWKER, SARAH PREBLE, 2184 Massachusetts Ave., Lexington 73, Massachusetts..... 1949
BOWMAN, CHARLES EDWARD, JR., 20 W. Orange St., Lititz, Pennsylvania. 1947
BOYCE, STEVE G[ADDY], Box 251, Ansonville, North Carolina..... 1950
BOYD, ELIZABETH M[ARGARET], Zoology Department, Mount Holyoke College, South Hadley, Massachusetts..... 1948
BOYD, HUGH J[AMES], 24 Bedminster Rd., Bristol 3, England..... 1949
BOYER, G[EORGE] F[REDERICK], R. R. No. 1, West Sackville, New Brunswick, Canada..... 1946
M BRACKBILL, HERVEY [GROFF], 4608 Springdale Ave., Baltimore 7, Maryland.....(1940) 1949
BRADBURN, DR. DONALD MUIR, 461 Pine St., New Orleans 18, Louisiana. 1949
BRADFORD, ALFRED S[TEVENS], 312 W. Prospect, Appleton, Wisconsin... 1948
BRADLEY, MISS ANNA PENFIELD, 352 Whitney Ave., New Haven, Connecticut..... 1933
BRADLEY, MISS HAZEL LOUISE, 908 W. Michigan Ave., Jackson, Michigan 1947
BRADLEY, LEONARD JOSEPH, Horseshoe Rd., Wilton, Connecticut..... 1946
BRADT, GEORGE MCCLELLAN, Overgaard School, Heber, Arizona..... 1950
BRADY, ETHEL W., Middletown, Delaware..... 1946
BRAEM, HELEN R[OSITTA], 24 E. Hyatt St., Mt. Kisco, New York..... 1949
BRAINERD, JOHN W., 67 Parkside St., Longmeadow, Massachusetts..... 1938
L BRAND, MRS. ALBERT R[ICH], 50 West 72nd St., New York 23, New York 1934
BRAND, CHARLES S., 36 Underwood Ave., Hilton, New York..... 1950
LM BRANDT, HERBERT WM., 2425 North Park Blvd., Cleveland 6, Ohio.(1915) 1947
BRASSARD, J. A[RMAND], Quebec Zoological Garden, Charlesbourg, Quebec, Canada..... 1949
BRAUNBERNS, JAMES E[DWARD], Eighteen Mile Creek Rd., Derby, New York..... 1949
BRAUNER, JOSEPH, 11233 Van Buren Ave., Los Angeles 44, California... 1933
BRECHER, LEONARD C[HARLES], 1900 Spring Dr., Louisville 5, Kentucky.. 1946
F BRECKENRIDGE, WALTER J[OHN], Museum of Natural History, University of Minnesota, Minneapolis, Minnesota.....(1926) 1950
BREIDING, GEORGE H[ERBERT], Oglebay Park, Wheeling, West Virginia. 1944
BRERETON, EWART LOUNT, Barrie, Ontario, Canada..... 1935
BRESLAU, LEO, 10 E. 38th St., New York, New York..... 1944
BRIGHAM, EDWARD MORRIS, JR., Kingman Museum of Natural History, Battle Creek, Michigan..... 1942
BRIGHAM, H[ERBERT] STORRS, JR., 3817 Sedgwick Ave., New York 63, New York..... 1946
BRINCKERHOFF, REMSEN, 156 Sherwood Pl., Englewood, New Jersey..... 1947
BRISTOW, MISS ALICE A[NDREWS], Silvermine Rd., Norwalk, Connecticut. 1949
BRISTOW, HARRY S[HERMAN], JR., Pine Ave., Cedars, Marshallton, Delaware..... 1940
BRITTAN, MARTIN RALPH, Department of Zoology, San Diego State College, San Diego, California..... 1947
BROADBOOKS, HAROLD E[UGENE], Department of Zoology, University of Arizona, Tucson, Arizona..... 1948

BROCK, JEAN A. M., Warson Rd., R. R. No. 5, Kirkwood 22, Missouri... 1946

M BRODKORB, [WILLIAM] PIERCE, Department of Biology, University of Florida, Gainesville, Florida.....(1925) 1937

BRODRICK, HAROLD JAMES, Petrified Forest, Holbrook, Arizona..... 1935

BROKAW, DEWITT P., 176 Rockview Ave., Plainfield, New Jersey..... 1947

M BROLEY, CHARLES LAVELLE, 609 Swann Ave., Tampa, Florida....(1926) 1949

BRONOEL, JOEL K[ENELM], 1703 E. 3rd St., Duluth 5, Minnesota..... 1950

BROOKING, MRS. A[LBERT] M[UNSELL], Hastings Museum, Hastings, Nebraska..... 1947

BROOKS, ALLAN CECIL, JR., North Pender Island, British Columbia, Canada..... 1946

HL BROOKS, EARLE AMOS, 166 Plymouth Rd., Newton Highlands, Massachusetts..... 1892

F BROOKS, MAURICE GRAHAM, Division of Forestry, West Virginia University, Morgantown, West Virginia.....(1930) 1950

M BROOKS, WINTHROP SPRAGUE, Kings Highway, Orleans, Massachusetts (1907) 1917

BROOMAN, EDWIN WILLIAM, 590 River St., E., Prince Albert, Saskatchewan, Canada..... 1943

BROOMAN, R[ONALD] C[HARLES], c/o Bank of Montreal, Kitchener, Ontario, Canada..... 1931

M BROUN, MAURICE, Hawk Mountain Sanctuary, R. R. No. 2, Kempton, Pennsylvania.....(1922) 1948

BROWN, CLARENCE D[UVALL], 222 Valley Rd., Montclair, New Jersey... 1937

BROWN, J. HAMMOND, 3800 Egerton Rd., Baltimore 15, Maryland..... 1948

BROWN, JERRAM L[EFEVRE], 19 Hitchcock Rd., Amherst, Massachusetts.. 1949

BROWN, NORMAN RAE, Faculty of Forestry, University of New Brunswick, Fredricton, New Brunswick, Canada..... 1946

BROWN, WENDELL, 4000 Highwood Rd., Minneapolis, Minnesota..... 1949

BROWN, WILLIAM E[DMOND], 333 Harmon Ave., N. W., Warren, Ohio... 1949

BROWN, WILLIAM JAMES, 4129 Dorchester St., W., Westmount, Quebec, Canada..... 1908

BROWN, WILMOT W., c/o Hotel Mexico, Chilpancingo, Guerrero, Mexico 1942

BROWN, WOODWARD H[ART], 4815 Ingersoll Ave., Des Moines 12, Iowa.. 1950

BRUESTLE, BERTRAM G[EORGE], 392 Whitney Ave., New Haven, Connecticut..... 1929

BRUMBAUGH, CHALMERS SHERFEY, 317 St. Dunstan's Rd., Homeland, Baltimore, Maryland..... 1916

BRUNDAGE, EDWARD J., Paul Smiths College, Paul Smiths, New York.... 1946

BRUNS, JAMES HENRY, 1820 Jefferson Ave., New Orleans, Louisiana.... 1942

L BRUTON, JA[ME]S D[EWITT], JR., Box 33, Plant City, Florida..... 1949

L BRUUN, CHARLES ANAULTUS, 1007 Waldheim Bldg., Kansas City, Missouri 1919

BRYANT, FREDERICK C[OPELAND], JR., 16 Wood End Lane, Bronxville, New York..... 1947

M BRYANT, HAROLD CHILD, Grand Canyon, Arizona.....(1913) 1918

BRYENS, OSCAR MCKINLEY, 231 S. Main St., Three Rivers, St. Joseph County, Michigan..... 1924

BUB, RICHARD ALBERT, 3037 N. 23rd St., Milwaukee 6, Wisconsin..... 1946

BUCHANAN, CHARLES M[CCAY], 104 W. Melrose Ave., Baltimore 10, Maryland..... 1949

BUCHANAN, FOREST W[ENDELL], Amsterdam, Ohio..... 1944
BUCHHEISTER, CARL W[ILLIAM], 1239 Madison Ave., New York 28, New York..... 1939
BUCHMANN, DR. FRED J., 2064 Hollydale Ave., Baton Rouge 15, Louisiana 1950
BUCK, D. ETHILBERT, 1840 N. 49th St., Omaha 4, Nebraska..... 1948
BUCKALEW, JOHN H[ERBERT], Box 71, Cambridge, Maryland..... 1948
BUCKLAND, GEORGE [HENRY] [EDWARD], R. R. No. 1, Batavia, New York 1948
BUCKNELL, DONALD [NEEDHAM], 134 Wonham St., Ingersoll, Ontario, Canada..... 1949
BULL, JOHN L., JR., 49 Merrall Rd., Far Rockaway, New York..... 1947
BULLARD, D. BRUCE, 1220 3rd Ave., S., Moorhead, Minnesota..... 1949
BULLARD, WINSTON M., Guilford, Connecticut..... 1950
BULLOCK, DILLMAN SAMUEL, Casilla 2-D, Angol, Chile..... 1920
BULLOCK, MISS [NORMA] JEAN, Glasco, Kansas..... 1950
BUMSTED, ALEC R., 221 N. Broad St., Middletown, Delaware..... 1949
BUNDICK, MISS HARRIET ELLEN, 1465 Columbia Rd., N. W., Washington 9, D. C..... 1924
BUNKER, ALFRED HERBERT, 462 Ossington Ave., Toronto, Ontario, Canada..... 1948
BUNTING, DR. HENRY, Hilldale Rd., Bethany, Connecticut..... 1943
BUNTING, HOWARD W[ILLIAM], 606 4th Ave., Troy, New York..... 1949
BURCH, ROSE LENORA [MRS. JOHN Q.], 4206 Halldale Ave., Los Angeles 37, California..... 1947
BURDICK, DONALD JAMES, 1148 Martin Ave., San Jose 11, California.... 1951
BURDSALL, RICHARD L., King St., Port Chester, New York..... 1947
BURELBACH, M. J., 510 W. 4th St., Chattanooga, Tennessee..... 1940
BURES, JOSEPH A., 148 N. 3rd St., West Newton, Pennsylvania..... 1944
BURGET, RUSSEL LINCOLN, R. R. No. 2, Perrysburg, Ohio..... 1947
BURKHART, MRS. ELIZABETH Z[IMMERMAN], Cedar Crest College, Allentown, Pennsylvania..... 1949
F BURLEIGH, THOMAS DEARBORN, School of Forestry, University of Idaho, Moscow, Idaho.....(1913) 1948
BURMEISTER, MELVIN W[ILLIAM], 5753 Dakin St., Chicago 34, Illinois... 1948
BURNER, CHARLES C[RAIG], 107 West Lindburg, Pittsburg, Kansas..... 1946
BURNETT, MISS FRANCES L., Proctor St., Manchester, Massachusetts... 1946
BURNS, ROBERT K[YLE], Carnegie Laboratory of Embryology, Wolfe and Madison Sts., Baltimore 5, Maryland..... 1947
BURR, IRVING W[INGATE], 265 Littleton St., West Lafayette, Indiana... 1939
BURTON, E[DWARD] MILBY, Charleston Museum, Charleston, South Carolina..... 1929
BUSHMAN, JOHN [BRANSON], 1621 Major St., Salt Lake City 4, Utah.... 1948
BUSS, IRVEN O[TTO], 1101 Third St., Menomonie, Wisconsin..... 1939
BUSSE, MILDRED W[ASHINGTON] [MRS. HERBERT A.], Gulf Island, Lewiston, Maine..... 1948
BUTCHART, MRS. G. REEVES, Museum of Zoology, University of Michigan, Ann Arbor, Michigan..... 1950
BUTLER, MRS. CHRISTELLA CAMPBELL, 3 Parkland Ave., Parkland, Pennsylvania..... 1946
BUTLER, THOMAS S[HERIDAN], 2971 San Isabel, Pueblo, Colorado..... 1949
BUXTON, ROBERT B[URNS], Box 427, Damariscotta, Maine..... 1949

BYRD, MITCHELL A[GEE], Virginia Cooperative Wildlife Research Unit, Blacksburg, Virginia 1950
BYRON, RICHARD, 1689 Amherst St., Buffalo 14, New York 1949
CADBURY, JOSEPH M[OORE], Johnson Court No. 1, 16 E. Johnson St., Germantown, Philadelphia, Pennsylvania 1940
CADE, TOM[MY JOE], Box 626, College, Alaska 1950
CADWALADER, JOHN, Ambler, Pennsylvania 1940
CADY, WALTER G[UYTON], Scott Laboratory, Middletown, Connecticut .. 1950
M CAHALANE, VICTOR H[ARRISON], Fish and Wildlife Service, Department of the Interior, Washington 25, D. C. ..... (1934) 1946
CAIN, MRS. JAMES R., 108 Park Ave. E., Savannah, Georgia 1947
CAIRNS, JOHN MACKAY, 919 Clay Ave., Scranton, Pennsylvania 1926
CALDWELL, MISS DOROTHY W., 80 Rockland St., Natick, Massachusetts. 1939
CALDWELL, N[EIL] MCK[EITHEN], c/o Fisheries Commission, Morehead City, North Carolina 1949
CALHOUN, MISS EMMA MAY, 50 Commonwealth Ave., Boston 16, Massachusetts 1921
CALLADINE, JAMES D[ENNIS], 14 Barbara Crescent, Toronto 8, Ontario, Canada 1949
CALVERT, EARL WELLINGTON, County Home, R. R. No. 2, Lindsay, Ontario, Canada 1919
CALVIN, ROBERT L[EAL], 508 Garfield Ave., New Castle, Pennsylvania .. 1950
CALVO, MANUEL J., 21 Dresden St., Kensington, Maryland 1948
CAMERON, DR. C[LIN] J[AMES], 5402 Izard St., Omaha 3, Nebraska 1949
CAMPBELL, ALBERT LEWIS, 345 W. 72nd. St., Chicago 21, Illinois 1947
CAMPBELL, MRS. ELIZABETH W[ARDER] C[ROZER], Green Pastures Ranch, Carson City, Nevada 1947
CAMPBELL, J[OHN] D[AVID], 1222 W. State St., Geneva, Illinois 1944
M CAMPBELL, LOUIS WALTER, 4531 Walker Ave., Toledo, Ohio ..... (1929) 1939
CAMPBELL, WILLIAM I[RA], 9 Barnesdale Ave. S., Hamilton, Ontario, Canada 1948
CAMRAS, DR. SIDNEY, 2921 W. Farragut Ave., Chicago 25, Illinois 1937
CANT, GILBERT, Box 637, Lavallette, New Jersey 1946
CARDIFF, EUGENE E[LVIN], R. R. No. 1, Rialto 2, California 1949
CARL, GEORGE CLIFFORD, Provincial Museum, Victoria, British Columbia, Canada 1941
CARL, HARRY G., 2304 Davie St., Davenport, Iowa 1949
CARLISLE, G[EORGE] LISTER, JR., Norfolk, Connecticut 1920
CARLISLE, MRS. JOHN H., 199 Aycrigg Ave., Passaic, New Jersey 1950
CARLTON, MRS. EUNICE A., 228 Brackett St., Portland 4, Maine 1947
L CARNES, MRS. HERBERT E., 25 Kenwood Road, Tenafly, New Jersey 1944
CARNIE, S. KENT, 1249 Latham St., Mountain View, California 1947
CARPENTER, CHARLES C., Department of Zoology, University of Michigan, Ann Arbor, Michigan 1951
CARPENTER, FORREST ALMON, 7345 Bryant Ave., S., Minneapolis 19, Minnesota 1948
CARPENTER, MAX M[AYNARD], R. R. No. 1, Dayton, Virginia 1948
CARR, WILLIAM H[ENRY], 1708 N. Santa Rita, Tucson, Arizona 1932
M CARRIKER, M[ELBOURNE] A[RMSTRONG], JR., c/o American Consul, Medellin, Colombia, South America ..... (1907) 1933
CARROLL, ROBERT P., 305 Letcher Ave., Lexington, Virginia 1938

CARSON, HAMPTON L[AWRENCE], JR., R. R. No. 2, Creve Coeur, Missouri 1935
CARSON, L[ENWOOD] B[ALLARD], 1306 Lincoln St., Topeka, Kansas..... 1948
CARTER, MRS. E. W. [BERTHA ROBERTSON], R. R. No. 4, Bowling Green, Ohio..... 1949
CARTER, T[HOMAS] DONALD, American Museum of Natural History, Central Park West at 79th St., New York 24, New York..... 1921
CARTWRIGHT, B[ERTRAM] W[ILLIAM], Ducks Unlimited, 201 Canada Bank of Commerce, Winnipeg, Manitoba, Canada..... 1924
CARTWRIGHT, WILLIAM J[AMES], Williamstown, Massachusetts..... 1920
CARVER, G[AIL] L[UKE], Mercer University, Macon, Georgia..... 1947
CASE, RALPH E., 3 East Trail, Darien, Connecticut..... 1949
CASSEL, J[OSEPH] FRANK[LIN], Zoology Department, North Dakota Agriculture College, Fargo, North Dakota..... 1935
CASTELLANO, LEONARD, 288 Hollywood Ave., Crestwood, New York.... 1950
CASTENHOLZ, RICHARD WILLIAM, 431 S. East Ave., Oak Park, Illinois... 1948
CASTLE, DR. GERALD H[ARVEY], 1404 Union Central Bldg., Cincinnati 2, Ohio..... 1950
CAYOUETTE, RAYMOND, Quebec Zoological Garden, Charlesbourg, Quebec, Canada..... 1936
CAZORT, MRS. MARY C., 5117 Edgewood Rd., Little Rock, Arkansas.... 1950
CHADWICK, HAROLD K[ING], 176 Ketcham Ave., Amityville, New York.. 1949
CHALIF, EDWARD LOUIS, Barnsdale Rd., Short Hills, New Jersey..... 1935
CHALLEY, JOHN R[AYMOND], 1349 Second St., N., Fargo, North Dakota.. 1948
M CHAMBERLAIN, EDWARD BURNHAM, 114½ Rutledge Ave., Charleston, South Carolina.....(1923) 1949
CHAMBERLAIN, GLEN DAVID, 22 Academy St., Presque Isle, Maine 1929
CHAMBERLAIN, NORMAN A[LLISON], "Critter Hill," R. R. No. 1, Matthews, North Carolina..... 1950
LM CHAMBERS, W[ILLIE] LEE, Robinson Rd., Topanga, California.....(1907) 1913
CHANNING, CLYDE HOWARD, U. S. Naval School of Music, Washington 25, D. C..... 1950
F CHAPIN, JAMES P[AUL], American Museum of Natural History, Central Park West at 79th St., New York 24, New York.....(1906) 1921
CHAPIN, DR. JOHN L[ADNER], Physiology Department, University of Colorado Medical School, Denver, Colorado..... 1950
CHAPIN, RUTH TRIMBLE [MRS. JAMES PAUL], 414 West 120th St., New York, New York 1932
CHAPMAN, DR. FLOYD BARTON, 393 Walhalla Rd., Columbus 2, Ohio.... 1936
CHAPMAN, HERMAN FLORAINE, 712 South Dakota Ave., Sioux Falls, South Dakota..... 1947
CHAPMAN, LAWRENCE BOYLSTON, 1 Woodridge Rd., Wellesley, Massachusetts..... 1930
CHASE, HENRY B[RIGHT], JR., 517 Decatur St., New Orleans 16, Louisiana 1948
CHESHIRE, W[ILLIAM] F[RANCIS], 4 Waverly Rd., Pointe Claire, Quebec, Canada..... 1950
CHILDS, HENRY E[VERETT], JR., 441 Boynton Ave., Berkeley 7, California 1948
CHOATE, DR. ERNEST A., 411 Rodman Ave., Jenkintown, Pennsylvania.. 1943
CHRISTIAN, JOHN J[ERMYN], Naval Medical Research Institute, Bethesda 14, Maryland..... 1948
L CHURCH, MISS CYNTHIA, The Point, Great Neck, Long Island, New York 1926
CHURCH, C[HARLES] T[HOMAS], 70 Pine St., New York 5, New York..... 1947

CHUTE, RICHARD S[EARS], 78 Upland Rd., Brookline 46, Massachusetts.. 1950
HL CLARK, AUSTIN HOBART, 1818 Wyoming Ave., N. W., Washington, D. C. 1899
CLARK, BENJAMIN S., White, Weld & Co., 40 Wall St., New York 5, New York.... 1950
CLARK, MISS EDITH [DELIA] M[AY], 25 School St., Glastonbury, Connecticut.... 1929
CLARK, FANNY DWIGHT [MRS. GRENVILLE], Dublin, New Hampshire.... 1940
CLARK, GEORGE R[OBERTS], W. Valley Green Rd., Flourtown, Pennsylvania.... 1926
CLARK, HAROLD WILLARD, Department of Biology, Pacific Union College, Angwin, California.... 1946
CLARK, JOHN L[INDSAY], Seven Fields, Sharp Hill Rd., Wilton, Connecticut 1950
CLARK, MISS MARTHA L., Box 1176, Danville, Virginia.... 1949
CLARK, TERENCE O['REILLY], 124 "F" Ave., Coronado, California..... 1949
CLARK, DR. THOMAS W., 400 E. Willow Grove Ave., Chestnut Hill, Philadelphia 18, Pennsylvania.... 1946
CLARKE, CHARLES EVERETT, 76 Ashland St., Medford 55, Massachusetts 1907
M CLARKE, C[HARLES] H[ENRY] D[OUGLAS], c/o Royal Ontario Museum of Zoology, 100 Queen's Park, Toronto, Ontario, Canada.....(1931) 1947
CLARKE, WILLIAM S., Jr., Box 167, State College, Pennsylvania..... 1947
L CLARKSON, ELIZABETH BARNHILL [MRS. EDWIN O.], Wing Haven, 248 Ridgewood Ave., Charlotte, North Carolina.... 1943
CLATTENBURG, ALBERT E[DWIN], JR., 190 Lakeside Rd., Ardmore, Pennsylvania.... 1929
CLAUSEN, ROBERT T[HEODORE], Department of Botany, Cornell University, Ithaca, New York.... 1928
CLAY, C. I., Box 353, Eureka, California.... 1950
CLAY, JOHN OWEN, 169 Beach Dr., Victoria, British Columbia, Canada.. 1948
CLAY, WILLIAM M[ARION], Department of Biology, University of Louisville, Louisville 8, Kentucky.... 1947
L CLEAVES, HOWARD HENDERSON, 8 Maretzek Court, Prince Bay, Staten Island, New York.... 1907
CLEBSCH, ALFRED, 838 Gracey Ave., Clarksville, Tennessee.... 1934
CLEGHORN, JAMES DONALD, 4866 Cote des Neiges Rd., Montreal, Quebec, Canada.... 1937
CLEMENT, ROLAND C[HARLES], Box 31, Providence 1, Rhode Island..... 1935
L CLEMENTS, H[IRAM] EVEREST, 49 Stoneham Rd., Rochester 10, New York 1950
CLEMENTS, WYNONA, 5255 Glasgow Way, Los Angeles 45, California.... 1950
CLOTFELTER, J[AMES] W[AYMAN], 121 Duncan Ave., Paris, Kentucky.... 1948
CLOUGH, GARI C[ONDE], South Plank Rd., R. R. No. 3, Newburgh, New York.... 1948
CLOW, MISS MARION [FRANCES], Box 163, Lake Forest, Illinois..... 1929
COBB, BOUGHTON, 25 E. End Ave., New York 28, New York..... 1948
COBB, HENRY IVES, JR., Sarles St., Mount Kisco, New York..... 1950
COBB, DR. STANLEY, 334 Adams St., Milton, Massachusetts..... 1909
M COFFEY, BEN BARRY, JR., 672 N. Belvedere, Memphis, Tennessee.(1929) 1950
COFFIN, MRS. FRANCIS HOPKINSON, 1512 Jefferson Ave., Scranton, Pennsylvania.... 1921
COGGINS, HERBERT LEONARD, 2764 Filbert St., San Francisco, California. 1898
COGSWELL, HOWARD L[YMAN], Museum of Vertebrate Zoology, Berkeley 4, California.... 1943

HL COLBURN, ALBERT E[RNEST], 510 S. Normandie Ave., Los Angeles, California..... 1891
COLBY, MRS. ROY B[ISHOP] [HAZEL I.], 60 Maine St., Topsham, Maine.. 1950
COLE, CHARLES FRANKLYN, 941 Corporation St., Beaver, Pennsylvania.. 1946
COLE, [MARGARET] EVELYN, Box 433, Greensboro College, Greensboro, North Carolina..... 1950
COLE, SANFORD ALLEN, 876 E. New York Ave., Brooklyn 3, New York.. 1950
COLE, MISS SARA WILEY, 260 Case Ave., Sharon, Pennsylvania..... 1950
COLES, VICTOR, University of Cincinnatti, Cincinnati 21, Ohio..... 1934
COLLIAS, NICHOLAS E[LIAS], Department of Zoology, University of Wisconsin, Madison, Wisconsin..... 1950
COLLINS, MRS. D. S., JR., [KATHRYN W.], Box 268, Jonesboro, Arkansas. 1950
L COLLINS, HENRY HILL, JR., "White Pines," Lanham, Maryland..... 1923
COLLINS, PERCY L., 18 Vanderbilt Ave., Milltown, New Jersey..... 1949
COLLISTER, ALLEGRA EDITH [MRS. CARL], 201 W. Platte Ave., Fort Morgan, Colorado..... 1949
COLLS, DAVID [GEOFFREY], 900 Dominion Public Bldg., Winnipeg, Manitoba, Canada..... 1949
COLTON, HAROLD S[ELLERS], Museum of Northern Arizona, Fort Valley Rd., Flagstaff, Arizona..... 1944
COLWELL, FREDERICK A[NDREW], R. R., Collegeville, Pennsylvania..... 1949
COMAN, DR. DALE REX, 4625 Osage Ave., Philadelphia 43, Pennsylvania. 1942
COMAN, EDWARD L., 26 Lake St., Wakefield, Rhode Island..... 1940
COMBY, JULIUS HUGH, 10044 E. Kratt Lane, Whittier, California..... 1943
COMMON, MINNA ANTHONY [MRS. JAMES A.], 141 Flower Ave., W., Watertown, New York..... 1941
COMPTON, MISS DOROTHY M[AY], 22 Wilton St., Princeton, New Jersey.. 1931
COMPTON, LAWRENCE V[ERLYN], Box 1898, Fort Worth, Texas..... 1926
CONE, EDWARD T[ONER], No. 1 Queenston Pl., Princeton, New Jersey... 1938
CONE, HUTCHINSON I., JR., Box 203, Ponte Vedra Beach, Florida..... 1947
CONGDON, HERBERT WHEATON, Box 55, Arlington, Vermont..... 1893
CONGDON, MARK HENDERSON, Box 80, Charlottesville, Virginia..... 1948
CONGDON, DR. RUSSELL T[HOMPSON], 122 S. Cleveland, Wenatchee, Washington..... 1947
CONKEY, JOHN HOUGHTON, 11 Chestnut St., Ware, Massachusetts..... 1929
CONN, ROBERT C., 769 Park Ave., Bound Brook, New Jersey..... 1945
CONWAY, ALBERT E[DWARD], Department of Psychology, Lafayette College, Easton, Pennsylvania..... 1938
COOK, MISS FANNYE A[DDINE], 1119 Pinehurst St., Jackson, Mississippi.. 1924
COOK, GEORGE L., Bashaw, Alberta, Canada..... 1946
COOK, JOHN W[ILLIAM], R. R. No. 2, Perkasie, Pennsylvania..... 1949
COOK, ROBERT E[DWIN], Main St., Elverson, Pennsylvania..... 1950
COOK, [WILLIAM] BOLTON, 20 Irenhyl Ave., Port Chester, New York.... 1929
LM COOKE, MISS MAY THACHER, Apt. 401, 1400 Fairmont St., N. W., Washington, D. C.....(1915) 1926
COOLIDGE, OLIVER H[ILL], Broad Brook Rd., Bedford Hills, New York.. 1928
COOLIDGE, PHILIP T[RIPP], Box 102, Bangor, Maine..... 1919
L COOMBES, R[OBERT] A[RMITAGE] H[AMILTON], Zoological Museum, Tring, Hertfordshire, England..... 1935
COON, F. A. HOWARD, 5 Grenville Mansions, Hunter St., London, W. C. 1, England..... 1947

COOPER, DONALD M[cINTOSH], 1680 York Ave., New York 28, New York. 1939
HL COPE, FRANCIS REEVE, JR., Dimock Post Office, Pennsylvania..... 1892
COPE, JAMES B[ONWILL], Earlham College, Richmond, Indiana..... 1948
HL COPELAND, MANTON, 88 Federal St., Brunswick, Maine..... 1900
CORBETT, KENNETH BLAIR, 704 N. Pine St., Lancaster, Pennsylvania.... 1947
COREY, EBEN F[OX], Barrett's Mill Rd., Concord, Massachusetts..... 1949
CORK, H[ENRY], 73 Queenswood Rd., Forest Hill, London, S. E. 23, England..... 1948
CORSGREEN, ROLF V[ICTOR], 385 Tryon Ave., Englewood, New Jersey... 1950
CORSON, WALTER H., Meadowbrook Lane, Chestnut Hill, Philadelphia 18, Pennsylvania..... 1950
F COTTAM, CLARENCE, Fish and Wildlife Service, Department of the Interior, Washington 25, D. C.....(1928) 1942
COTTRELL, G[EORGE] W[ILLIAM], JR., 70 Lakeview Ave., Cambridge 38, Massachusetts..... 1938
COUCH, MISS LAURA LOUISE, E. Second Ave., Easley, South Carolina... 1950
COULTER, MALCOLM W[ILFORD], Maine Cooperative Wildlife Research Unit, 121 E. Annex, University of Maine, Orono, Maine..... 1949
COURSEN, C[HARLES] BLAIR, 761 E. 69th Pl., Chicago, Illinois..... 1928
COURT, EDWARD J[AY], 1723 Newton St., N. W., Washington, D. C..... 1946
COVERT, JAMES L[EE], R. R. No. 1, Finchville, Kentucky..... 1949
M COWAN, IAN MCTAGGART, Department of Zoology, University of British Columbia, Vancouver, British Columbia, Canada.....(1939) 1941
COX, MISS ELIZABETH R[AND], 1411 Highland Ave., Plainfield, New Jersey 1949
COX, MRS. FRANK G., 2415 W. 17th St., Wilmington 73, Delaware..... 1947
COX, JAMES LEE, Box 950, State Game Farm, Carlsbad, New Mexico.... 1946
COX, SAM M[ADISON], 127 N. 10th Ave., E., Duluth 5, Minnesota..... 1947
COX, MRS. THOMAS J., 316 N. Union St., Kokomo, Indiana..... 1947
CRAGG, HOYT J., 4451 Tupelo St., Baton Rouge, Louisiana..... 1947
CRAIG, WALLACE, 10 Bowdoin St., Cambridge 38, Massachusetts..... 1912
M CRANDALL, LEE [SAUNDERS], New York Zoological Park, New York, New York.....(1909) 1930
L CRANE, CORNELIUS, 836 S. Michigan Ave., Chicago, Illinois..... 1930
CRAVENS, MARCUS E[DWARD], Box 127, Santa Barbara, California..... 1950
CRAWFORD, ALAN, JR., White Horse Rd., Devon, Pennsylvania..... 1949
CRAWFORD, MARY NEWELL, White Horse Rd., Devon, Pennsylvania.... 1946
CREAGER, JOE C[LYDE], Drawer 1267, L. A. Cann Dr., Ponca City, Oklahoma..... 1948
CRIDDLE, STUART, Treesbank, Manitoba, Canada..... 1949
CRIMMINGS, MISS MARJORIE [JANE], 41 Clover St., Yonkers 3, New York. 1949
CRINGAN, A. T., Box 565, Sioux Lookout, Ontario, Canada..... 1948
CRITCHER, T[ITUS] STUART, 809 Colleton Rd., Raleigh, North Carolina... 1948
CROMPTON, DAVIS H[ASTINGS], 74 William St., Worcester, Massachusetts. 1934
CROOK, COMPTON, Warren Rd., Phoenix, Maryland..... 1933
CROSS, FRANK C[LAY], 9413 Second Ave., Silver Spring, Maryland..... 1949
CROUCH, JAMES E[NSIGN], San Diego State College, San Diego, California. 1928
CROWDER, ORVILLE W., Chase, Maryland..... 1947
CROWELL, PRINCE SEARS, JR., Department of Zoology, Indiana University, Bloomington, Indiana..... 1946
CROWELL, MRS. PRINCE SEARS, 4 Maple St., Franklin, Massachusetts... 1930
L CROWINSHIELD, MRS. FRANCIS, Peach Point, Marblehead, Massachusetts. 1941

M CRUICKSHANK, ALLAN D[UDLEY], Highland Hall, Rye, New York..(1933) 1945
CRUTTENDEN, JOHN R., Blackstone Bldg, Quincy, Illinois..... 1940
CRYMES, FRANK HODGES, 5 Forest Lane, Berkeley 8, California..... 1940
CUNNINGHAM, JAMES W., 3009 E. 19th St. Terrace, Kansas City, Missouri. 1937
CUNNINGHAM, MISS NANCE CONNELLY, 702 Marshall, Houston 6, Texas. 1949
CUNNINGHAM, TINSLEY HALTER, Falls Rd., R. R. No. 2, Rockville, Maryland.....1947
CUNNINGS, C. C[ASTLE], 189 Wall St., Corning, New York..... 1950
CURL, DR. A[LFRED] LAURENCE, 7360 Rockway Ave., El Cerrito, California..... 1950
CURRY, HASKELL B[ROOKS], Department of Mathematics, Pennsylvania State College, State College, Pennsylvania..... 1943
CURRY, MISS MARCIA FRANCES, Department of Biology, University of Colorado, Boulder, Colorado..... 1950
CURTIS, MISS ELIZABETH L[ONG], 5648 Beach Dr., Seattle, Washington.. 1934
L CURTIS, RICHARD C[ARY], 30 State St., Boston, Massachusetts..... 1935
CURTIS, MRS. VEE KAELIN, 1450 Bancroft Way, Berkeley 2, California.. 1947
CUSA, N[OEL] W[ILLIAM], 60 Colwyn Rd., Bramhall, Cheshire, England.. 1948
CUTRESS, CHARLES E., 5620 S. E. Aldercrest Rd., Milwaukie, Oregon.... 1946
DAMBACH, CHARLES A[RTHUR], 7085 Linworth Rd., R. R. No. 2, Worthington, Ohio..... 1938
DANA, EDWARD F[OX], 57 Exchange St., Portland, Maine..... 1941
DANIELS, GEORGE GOETZ, 88 Woodland Rd., Short Hills, New Jersey.... 1947
DARBY, R[OLLO] E[VERETT], Box 3843-A, R. R. 3, Carmichael, California 1950
DARBY, RICHARD T[HORN], 5046 Chancellor St., Philadelphia 39, Pennsylvania..... 1936
DARLING, AVERIL [MRS. F.], The Old Rectory, Lilley, Nr. Newbury, Berkshire, England..... 1949
DATER, MRS. JOHN Y., JR. [ELEANOR E.], 259 Grove St., Ramsey, New Jersey..... 1949
DAVEY, DR. WINTHROP N., University Hospital, Ann Arbor, Michigan... 1946
DAVIDSON, MRS. GAYLORD [FRANCES STILLMAN], 4700 Emerson Ave. S., Minneapolis 9, Minnesota..... 1949
DAVIDSON, WILLIAM M[ARK], 1504 Bodell St., Orlando, Florida..... 1927
DAVIS, ALTON [THOMAS], JR., 549 Collier Rd. N. W., Atlanta, Georgia... 1949
DAVIS, MISS BERTHA EUNICE, 44 Centre St., Brookline, Massachusetts.. 1920
DAVIS, CLIFFORD V[ERNON], 730 S. Tracy St., Bozeman, Montana..... 1948
M DAVIS, DAVID E[DWARD], School of Hygiene and Public Health, Johns Hopkins University, Baltimore 5, Maryland.....(1935) 1941
DAVIS, EARLE A., JR., Vivarium Bldg., University of Illinois, Champaign, Illinois..... 1946
DAVIS, DR. EDWIN GRIFFITH, 4633—28th Rd. S., Arlington, Virginia.... 1940
DAVIS, GERTRUDE L. [MRS. JAMES M.], 203 Collingsworth Dr., Rochester 10, New York..... 1949
DAVIS, HOWARD HENRY, Little Stoke, Patchway, nr. Bristol, England... 1946
DAVIS, JOHN, 1420 E. Mountain St., Pasadena, California..... 1939
DAVIS, JOHN M., 1695 Hampton Ave., Redwood City, California..... 1920
DAVIS, L[OUIE] IRBY, Box 988, Harlingen, Texas..... 1935
DAVIS, MALCOLM, 904 11th St., S. E., Washington, D. C..... 1930
DAVIS, SHELDON LESLIE, Box 56, Eganville, Ontario, Canada..... 1946

M DAVIS, WILLIAM B., Department of Wildlife Management, A. and M. College of Texas, College Station, Texas.....(1938) 1949
DAVIS, WILLIAM E[DWIN], 260 School St., Belmont 78, Massachusetts.... 1949
DAVIS, WILLIAM FRANKLIN, 423 W. 46th St., Astabula, Ohio..... 1947
DAVISSON, A[RTHUR] PAUL, 1112 Fleming Ave., Fairmont, West Virginia. 1949
DAWE, ARNOLD L[EWIS], R. R. No. 2, Weston, Ontario, Canada..... 1948
DAWN, WALTER H[ENRY], 1143 Rogers Ave., Brooklyn 26, New York.... 1947
DAWSON, RICHARD G[LEN], 6114 Indiana Ave., Kansas City 4, Missouri.. 1949
DAWSON, WILLIAM RYAN, 2117 Tenth Ave., Los Angeles 16, California.. 1947
DAY, MRS. KATHARINE C[LARK], 101 Mt. Vernon St., Boston, Massachusetts..... 1940
DEAN, A. LAWRENCE, Department of Poultry Husbandry, Virginia Polytechnic Institute, Blacksburg, Virginia..... 1939
DEAN, MRS. BLANCHE E., 1503 Ridge Rd., Homewood, Birmingham 9, Alabama..... 1949
DEAN, DONALD, 4474 Maryland Ave., St. Louis 8, Missouri..... 1949
L DEAN, MRS. RUTHVEN, 830 Hibbard Rd., Winnetka, Illinois..... 1935
DEAN, SUE McELDOWNEY [MRS. F. C.], 14 Middle St., Orono, Maine.....
DEAN, WILLIAM B., 534 Fruit Hill Ave., North Providence 11, Rhode Island..... 1946
DEANGELO, ANGELO RALPH, 809 Palisade Ave., Union City, New Jersey. 1946
DEAR, L[IONEL] S[EXTUS], Box 127, Port Arthur, Ontario, Canada..... 1928
DEBES, VICTOR ALBERT, 1211 Folsom Ave., Prospect Park, Pennsylvania 1929
DECAMPS, ERNEST JULES, Box 316, Beaufort, South Carolina..... 1946
DECARIE, JULES ALBERT, 4121 Marlowe Ave., Montreal, Quebec, Canada 1932
DECHEN, MRS. LILLIAN O[RVETTA], 14 Summer St., Port Dickinson, Binghamton 6, New York..... 1949
DECKER, ANTON M[ICHAEL], Box 402, Middlebury, Vermont..... 1949
DECKER, GEORGE [WILLIAM], Dover Plains, New York..... 1949
DECOU, RICHARD W[ILLIAM], Crosswicks, New Jersey..... 1949
DEETZ, JAMES J[OHN] F[ANTO], 503 Baltimore Ave., Cumberland, Maryland..... 1949
DEFLON, DR. ERIC G., 242 Pine St., Chadron, Nebraska..... 1950
DEGROOT, DUDLEY S[ARGENT], 424 S. Hermosa, Albuquerque, New Mexico..... 1947
DEICHMANN, HENRIK, Moss Glen, New Brunswick, Canada..... 1947
F DEIGNAN, HERBERT G[IRTON], Division of Birds, United States National Museum, Washington 25, D. C.....(1923) 1946
F DELACOUR, JEAN, American Museum of Natural History, Central Park West at 79th St., New York 24, New York.....(1920) 1946
DE LA VEGA, MARIO, JR., c/o Sucs. de Alonso y Cia, S. A., Aptdo. No 337, Habana, Cuba..... 1949
DEL CAMPO, RAFAEL [SANCHEZ] MARTÍN, Instituto de Biologia, Casa del Lago, Chapultepec, Mexico D. F., Mexico..... 1948
DELISLE, DONALD GORDON, 2322-11 Patterson Dr., Eugene, Oregon.... 1945
DEL TORO, MIGUEL ALVAREZ, Aptdo. Postal No. 6, Tuxtla Gutierrez, Chiapas, Mexico..... 1947
DELURY, RALPH EMERSON, 330 Fairmont Ave., Ottawa, Ontario, Canada 1920
DEMEYER, MARIUS M[UTILLOD], 429 North St., Yreka, California..... 1950
DENHAM, REGINALD, 100 Central Park S., New York, New York..... 1947

DENKER, CHARLES REED, c/o DuPont, S. A. Aptdo. No. 1799, Mexico D. F., Mexico 1944
DENMAN, CLAYTON C., 1751 Naomi Pl., Seattle 5, Washington 1947
DENMEAD, TALBOTT, 2830 St. Paul St., Baltimore 18, Maryland 1923
DENNIS, JOHN V[ALUE], Box 389, Leesburg, Virginia 1948
M DENTON, J[AMES] FRED, 1510 Pendleton Rd., Augusta, Georgia ..... (1935) 1950
HL DERBY, DR. RICHARD, Oyster Bay, Long Island, New York 1898
DERBY, MISS RUTH I., Box 272, Lee, Massachusetts 1947
DERLETH, AUGUST [WILLIAM], Sauk City, Wisconsin 1939
DERMID, JACK F[RANKLIN], 520 E. Worthington Ave., Charlotte 3, North Carolina 1948
LF DE SCHAUENSEE, RODOLPHE M[EYER], Devon, Pennsylvania ..... (1925) 1942
L DESMOND, THOMAS C[HARLES], Box 670, Newburgh, New York 1929
DETTMANN, WARREN, Milwaukee Public Museum, Milwaukee, Wisconsin 1936
DEUEL, [HAROLD] FRANCIS, 453 "F" St., Arcata, California 1950
DEUSING, MURL, 5427 W. Howard, Milwaukee, Wisconsin 1935
DEVANEY, BERNARD [CHARLES], 212 Nevin St., Lancaster, Pennsylvania 1948
DE VEL, DR. LEON, 739 Plymouth Blvd. S. E., Grand Rapids 6, Michigan 1948
DEVITT, OTTO EDMUND, 68 Donegall Dr., Toronto 17, Ontario, Canada .. 1933
DEXTER, RALPH W[ARREN], Kent State University, Kent, Ohio 1942
DICE, LEE RAYMOND, Laboratory of Vertebrate Biology, University of Michigan, Ann Arbor, Michigan 1944
DICK, JOHN HENRY, Dixie Plantation, Meggett, South Carolina 1949
DICKENS, MISS ELIZABETH, Dickens Point, Block Island, Rhode Island .. 1921
DICKERMAN, ROBERT W[ILLIAM], West Shore, Ithaca, New York 1949
L DICKEY, MRS. FLORENCE V. V., 2100 Jackson St., San Francisco 15, California 1948
DICKINSON, J[OSHUA] C[LIFTON], JR., Department of Biology, University of Florida, Gainesville, Florida 1937
DIEDRICH, JOHN LESTER, 3125 W. Pierce St., Milwaukee 4, Wisconsin ... 1948
DIETZ, VIOLA V[ERONICA], 60 N. Tremont St., York, Pennsylvania 1949
DILLEY, WILLARD E., 104 N. E. 18th St., Homestead, Florida 1936
DINGLE, EDWARD VON SIEBOLD, Huger, South Carolina 1920
DISE, MRS. MARY DAMERON, 426 Victoria Ave., Lynchburg, Virginia 1928
DIXON, B. O. G., Cassidy Post Office, Vancouver Island, British Columbia, Canada 1949
DIXON, MISS CLARA, Albion College, Albion, Michigan 1947
DIXON, JAMES B[ENJAMIN], Box 1143, R. R. No. 3, Escondido, California . 1939
LM DIXON, JOSEPH S[CATTERGOOD], Box 357, Star Route, Escondido, California ..... (1917) 1923
DIXON, KEITH L[EE], Museum of Vertebrate Zoology, Berkeley 4, California 1943
DIXON, RALPH E., Box 810, Star Route, Escondido, California 1947
DOBIE, MRS. J. FRANK, 702 Park Pl., Austin, Texas 1948
DODGE, ERNEST S[TANLEY], Peabody Museum, Salem, Massachusetts 1936
DODGE, THOMAS H., Truxton Canyon Agency, Valentine, Arizona 1947
DODGE, VICTOR KENNEY, 137 Bell Court W., Lexington, Kentucky 1937
DOERHOEFER, BASIL, Box 538, R. R. No. 6, Louisville, Kentucky 1949
DOERING, HUBERT R., 414 Rivard Blvd., Grosse Pointe 30, Michigan 1944
DONALD, MISS MARY F[RANCES], 6918 Belmont Lane, Milwaukee 11, Wisconsin 1949

DOOLEY, RICHARD F[RANCIS], 386 Tremaine Ave., Kenmore 17, New York 1949
DORNAN, JOHN, E. Graver's Lane and Flourtown Rd., Chestnut Hill, Philadelphia 18, Pennsylvania 1947
DOUGLASS, DONALD W[ICKWARE], Game Division, Michigan Department of Conservation, Lansing 13, Michigan 1943
DOWLING, P[AUL] BRUCE, R. R. No. 1, Mapleton Depot, Huntington County, Pennsylvania 1950
DOWNS, THEODORE, Museum of Paleontology, University of California, Berkeley 4, California 1942
DRESSEL, EVAN C[HARLES], Western Reserve Rd., R. R. No. 1, Poland, Ohio 1949
DREW, ELAINE M. [MRS. HOWARD ALBERT], 47 Maple Grove, Barre, Vermont 1934
DRINKWATER, HOWARD [FRANK], Old Road, Whitehouse, New Jersey 1950
DRIVER, E. RAYMOND, Box 234, R. R. No. 1, Central Point, Oregon 1946
DRURY, WILLIAM HOLLAND, JR., Paradise Rd., Newport, Rhode Island .. 1935
M DUBOIS, ALEXANDER DAWES, Christmas Lake Rd., R. R. No. 4, Excelsior, Minnesota ..... (1905) 1950
DUDLEY, JOHN MURCHIE, 20 Germain St., Calais, Maine 1931
M DUMONT, PHILIP A[TKINSON], 4114 Fessenden St., N. W., Washington 16, D. C. ..... (1927) 1941
DUNDAS, LESTER HARVEY, Rice Lake Wildlife Refuge, East Lake, Minnesota 1941
DUNHAM, MRS. CAROLINE A[LLEN], 450 Beverly Rd., Ridgewood, New Jersey 1933
DUNLAP, MRS. LUTHER [AVA KENT], 2817 Woolsey St., Berkeley 5, California 1949
DUNLAP, MISS MINERVA F., Box 11, R. R. No. 1, Bowdoinham, Maine .. 1947
DUNLAP, V[INING] C[AMPBELL], c/o United Fruit Company, La Lima, Honduras 1950
DUNN, DR. FRED SQUIER, 115 E. 61st St., New York, New York 1946
DUNNING, JOHN S[TEWART], 150 Notch Rd., Granby, Connecticut 1950
DURAND, HERBERT KYLE, 219 S. Randall, Pasadena, Texas 1950
DURNING, MRS. ELIZABETH HAMILTON, 306 Claremont Ave., Louisville 6, Kentucky 1948
M DUVALL, ALLEN J[OSEPH], United States National Museum, Washington, D. C. ..... (1942) 1948
DYER, WILLIAM, Union City, Michigan 1946
DYKE, SAM[UEL] H[ULL], R. R. No. 6, Lancaster, Pennsylvania 1949
EASTMAN, FRANCIS B[UCK], Box 434, Mandeville, Louisiana 1949
EASTMAN, WHITNEY [HASKINS], 2240 West Lake of the Isles Blvd., Minneapolis 5, Minnesota 1949
EATON, RICHARD J[EFFERSON], Bedford Rd., Lincoln, Massachusetts 1930
EATON, STEPHEN W[OODMAN], Department of Biological Sciences, St. Bonaventure College, St. Bonaventure, New York 1942
EBERT, MRS. ERNEST C. [RUTH], 3540 Pierce St., San Francisco 23, California 1946
ECKELBERRY, DON [RICHARD], Bentleyville Rd., R. R. No. 5, Chagrin Falls, Ohio 1942
EDDY, GARRETT, 4515 Ruffner St., Seattle 99, Washington 1939

EDEBURN, RALPH M[ILTON], Marshall College, Huntington 1, West Virginia 1947
EDEY, MAITLAND A[RMSTRONG], Wolver Hollow Rd., Brookville, Long Island, New York 1948
EDGE, MRS. CHARLES NOEL, Emergency Conservation Committee, 767 Lexington Ave., New York, New York 1938
HL EDSON, JOHN MILTON, 336 W. 50th St., Seattle, Washington 1886
EDWARDS, ALICE N[ETTLETON], [MRS. O. M.], Grassy Lane Farm, Cazenovia, New York 1949
EDWARDS, ERNEST P[RESTON], Box 611, Amherst, Virginia 1949
EDWARDS, FRANK, "Trevor," Greave, Romiley, Cheshire, England 1949
EDWARDS, HILARY G[ORDON], Box 29, R. R. No. 1, Oklahoma City 11, Oklahoma 1950
EDWARDS, ROBERT D[AVIS], "Ardea," McClellanville, South Carolina 1949
EDWARDS, R[OGER] YORK, 426 Castlefield Ave., Toronto 12, Ontario, Canada 1947
EICHLER, HERBERT P., 2211 Andrews Ave., New York 53, New York 1947
EINHORN, BENJAMIN, 7 Parker Ave., West Deal, New Jersey 1946
EISENHART, RUTH C[ECILIA], Apt. 47, 423 W. 120th St., New York 27, New York 1949
L EISENMANN, EUGENE, 11 Broadway, New York, New York 1936
EISENMAYER, MISS BETTY J[EAN], 1917 N. Main Ave., Springfield 1, Missouri 1950
EKBLAW, GEORGE E[LBERT], 511 W. Main St., Urbana, Illinois 1946
EKDAHL, CONRAD H[OWARD], 401 N. Stone Ave., La Grange, Illinois 1948
EKLUND, DR. CARL M[ILTON], Rocky Mountain Laboratory, Hamilton, Montana 1950
L ELDREDGE, EVERETT, Chatham, Cape Cod, Massachusetts 1928
ELIOT, SAMUEL A[TKINS], JR., 31 Dryads Green, Northampton, Massachusetts 1936
ELIOT, THEODORE L[YMAN], Golden Gate Ave., Belvedere, California 1940
ELKINS, KIMBALL C[ONRO], 3½ Madison St., Cambridge, Massachusetts .. 1940
ELLIOTT, CHARLES FREMONT, 75 Anderson St., Hackensack, New Jersey .. 1936
ELLIOTT, JOHN JACKSON, 3994 Park Ave., Seaford, Long Island, New York 1940
ELLIS, MISS HAZEL ROSETTA, Keuka College, Keuka Park, New York 1935
ELLWOOD, JAMES R., Sheldon Rd., R. R. No. 2, Valencia, Pennsylvania .. 1950
ELSTAD, MISS AGNES, 3710 N. Morgan Ave., Minneapolis 12, Minnesota .. 1949
ELSTONE, ROBERT O[LIVER], 249 Charlton Ave. W., Hamilton, Ontario, Canada 1950
ELY, CHARLES [ADELBERT], R. R. No. 2, Wellsboro, Pennsylvania 1948
EMERSON, DAVID LOWELL, 155 Burt St., Taunton, Massachusetts 1940
EMERSON, GUY, 16 E. 11th St., New York 3, New York 1947
EMERSON, MISS MARY LOUISE, 587 Ashland Ave., Buffalo 22, New York .. 1949
EMERSON, STEPHEN, 806 W. Main St., Urbana, Illinois 1950
EMERY, F[RANK] H[ARDIE], 29 Old Mill Terrace, Toronto, Ontario, Canada 1928
EMERY, MAURICE C., 225 Belmont St., Wollaston 70, Massachusetts 1949
M EMILIO, S[HEPARD] GILBERT, Gilford, New Hampshire ..... (1922) 1938
F EMLEN, JOHN T[HOMPSON], JR., Department of Zoology, University of Wisconsin, Madison 6, Wisconsin ..... (1925) 1949
ENGELING, GUS A[UGUST], 300 East Angelina, Palestine, Texas 1950

ENGLISH, ALMON OWEN, 2803 Rosalind Ave., S. W., Roanoke, Virginia.. 1928
ENGLISH, P[ENNOYER] F[RANCIS], Department of Zoology, Pennsylvania State College, State College, Pennsylvania..... 1938
ENNIS, J[AMES] HAROLD, Cornell College, Mount Vernon, Iowa..... 1941
ENSSLER, HARRY THOMAS, 6336 Tabor Ave., Philadelphia 11, Pennsylvania 1946
EPHRAIM, WILLIAM A[BBE], 1630 Grand Ave., Bronx, New York 53, New York..... 1949
ERICKSON, ARNOLD BURTON, 1005–06 Commerce Bldg., St. Paul 1, Minnesota..... 1936
M ERICKSON, MARY MARILLA, 3505 Foothill Rd., Santa Barbara, California (1947) 1950
ERICKSON, RAY C[HARLES], 1104 Washington Ave., St. Peter, Minnesota. 1946
ERNST, ROGER, 170 Sargent Rd., Brookline, Massachusetts..... 1941
M ERRINGTON, PAUL L[ESTER], Insectary, Iowa State College, Ames, Iowa (1932) 1936
ESCHELMAN, DR. KARL F[ERDINAND], 8 North Dr., Buffalo 16, New York 1949
ESTEBAN, JUAN G[ERÓNIMO], Instituto Miguel Lillo—205, Tucumán, Argentina..... 1949
ETTER, ALDRED G., Brookhill Farm, Clarksville, Missouri..... 1947
EVANS, DR. EVAN MORTON, 550 Park Ave., New York, New York..... 1916
EVANS, J[OHN] HARWOOD, 517 Jackson Dr., Oshkosh, Wisconsin..... 1948
EVANS, L[ORENZO] LLOYD, 503 California Ave., Libby, Montana..... 1950
EVANS, W[ILLIAM] E[SAU], 3rd, Telephone Pole 172, Alderson, Luzerne County, Pennsylvania..... 1949
EVENDEN, FRED G[EORGE], JR., 3434 57th St., Sacramento 17, California.. 1949
EVERETT, MISS CONSTANCE A[NTOINETTE], 206—9th St., N. E., Waseca, Minnesota..... 1948
EYER, LESTER E[MERY], 833—A Chestnut Rd., East Lansing, Michigan.. 1948
EYNON, ALFRED ERNEST, 5 Beach Rd., Verona, New Jersey..... 1934
EYRE, JOHN ALFRED, 460 Gladstone Ave., Toronto 4, Ontario, Canada.... 1947
EYSTER, MARSHALL B[LACKWELL], Department of Biology, Southwestern Louisiana Institute, Lafayette, Louisiana..... 1949
FABER, LESTER FRANCIS, 1216 56th St., Des Moines, Iowa..... 1947
FACKLAM, MISS ROSE W., c/o Harvey & Carey, Inc., 327 Elm St., Buffalo 3, New York..... 1949
FAGER, DR. EDWARD W[ILLIAM], 6019 S. Ingleside Ave., Chicago 37, Illinois..... 1950
FAIR, RICHARD [MARTIN], 1155 S. Downing St., Denver 10, Colorado.... 1949
FAIRBANKS, MRS. PAUL H. [VIRGINIA B.], United States Forest Service, Pinehurst Ranger Station, Miramonte, California..... 1948
FALES, JOHN H[OUSE], 1917 Elkhart St., Silver Spring, Maryland..... 1939
FARGO, WILLIAM GILBERT, 506 Union St., Jackson, Michigan..... 1923
M FARNER, DONALD S[AUKEY], Department of Zoology, State College of Washington, Pullman, Washington.....(1941) 1946
FARRAR, MERRITT C[ALVIN], 942 Bonita Dr., Winter Park, Florida..... 1946
FARREL, FRANKLIN, 3RD, Northrup Rd., Woodbridge, Connecticut..... 1950
FARRINGTON, S[ELWYN] KIP, JR., Main St., East Hampton, Long Island, New York..... 1949
FAST, ARTHUR H., 4924 Rock Spring Rd., Arlington, Virginia..... 1946
FAUVEL, BERTRAM A., 263 McLeod St., Ottawa, Ontario, Canada..... 1948

FAUTIN, REED WINGATE, Department of Zoology and Physiology, University of Wyoming, Laramie, Wyoming 1938
FAVOUR, PAUL G[ORDON], JR., Shenandoah National Park, Luray, Virginia 1949
FAWVER, BEN J[UNIOR], State Teachers College, Mankato, Minnesota 1947
FEATHERSTONHAUGH, [JAMES] DUANE, Mount Maria, Duanesburg, New York 1948
FEENEY, THOMAS J[OHN], 1430 Clay St., Davenport, Iowa 1948
FEGEL, ARTHUR C., Box 840, R. R. No. 1, Rahway, New Jersey 1943
FEIGHNER, MISS LENA VETA, 298—1 S. Tremont St., Kansas City, Kansas 1934
HL FELGER, ALVA HOWARD, Broomfield, Colorado 1898
FENNELL, CHESTER M[ARTIN], 21475 Hillsdale Ave., Fairview Park 26, Ohio 1948
FERDINAND, [PETER] L[ORENZ], Scr. Kjeldsgade 12, Copenhagen, Denmark 1949
FERGUSON, DAVID SOWERS, Box 53, R. R., Philipsburg, Pennsylvania 1937
L FERGUSON, HOMER LENOIR, Newport News Ship Bldg., Newport News, Virginia 1926
FERGUSON, WILLIAM HENRY, 5907 Mason St., Omaha, Nebraska 1946
FERNANDEZ, DRA. RAMONA, Museo Poey, Catedra "U," Escuela de Ciencias, Universidad de la Habana, Habana, Cuba 1950
FICKETT, STEPHEN BURROWS, JR., Box 645, Cross City, Florida 1948
FIELD, MISS CAROLINE L[OUISA], 38 Hampton Court, 1461 Mountain St., Montreal, Quebec, Canada 1928
FIELD, MARSHALL [HOWARD], R. R. No. 2, St. Thomas, Ontario, Canada .. 1948
FILER, ERVIN E., Illinois Natural History Survey, Urbana, Illinois 1950
FILLEBROWN, THOMAS SCOTT, Box 27, Woodstock, Vermont 1947
FINDLEY, JAMES SMITH, Museum of Natural History, University of Kansas, Lawrence, Kansas 1948
FINDLEY, J[OHN] S[COTT], 1201 S. Center Ave., Sioux Falls, South Dakota. 1950
HLM FINLEY, WILLIAM LOVELL, c/o Mrs. Arthur N. Pack, Ghost Ranch Lodge, 801 Casa Grande Rd., Tucson, Arizona ..... (1904) 1907
FISCHER, RICHARD B., Laboratory of Ornithology, Fernow Hall, Cornell University, Ithaca, New York 1947
FISCHER, RUDOLPH, 215 E. Foothill Blvd., LaVerne, California 1949
F FISHER, HARVEY I[RVIN], Department of Zoology, University of Illinois, Urbana, Illinois ..... (1944) 1950
FE FISHER, WALTER K[ENRICK], Box 239, Pacific Grove, California .. (1889) 1920
FISHER, WALTER TAYLOR, 949 Fisher Lane, Winnetka, Illinois 1932
FISK, DR. GUY H., 592 Walpole Ave., Montreal 16, Quebec, Canada 1947
FITCH, F. W., JR., Box 548, Auburn, Alabama 1947
FITCH, HENRY S[HELDON], Natural History Reservation, University of Kansas, R. R. No. 3, Lawrence, Kansas 1946
FLANNERY, MARGARET W., 44 Barber St., W., Wilson 5, Connecticut 1949
FLEETWOOD, RAYMOND J[UDY], Bosque del Apache National Wildlife Refuge, San Antonio, New Mexico 1942
FLEISHER, DR. EDWARD, Brooklyn College, Brooklyn 10, New York 1943
FLEMING, MRS. THOMAS, JR., 1541 Lombardy Rd., Pasadena, California .. 1935
FLEXNER, JOHN M[ORRIS], 2204 Douglass Blvd., Louisville 5, Kentucky .. 1949
FLINTON, MR. LAUREL, JR., 1288 Lloyd George Ave., Crawford Park, Verdun, Quebec, Canada 1950

FLOOD, GRACE [MRS. AUBREY CLEVELAND], 455 Linden Rd., Birmingham, Michigan 1933
FLOYD, CHARLES BENTON, 454 Wolcott St., Auburndale, Massachusetts.. 1916
FLUCK, DR. PAUL HAVENS, 73 N. Union St., Lambertville, New Jersey... 1948
FLUEKIGER, MISS DORA WHILMAN, Hotel Dauphin, Broadway at 67th St., New York 23, New York 1947
FOLEY, EDWARD J[AMES], 5349 N. Bay Ridge Ave., Milwaukee 11, Wisconsin 1947
FOLGER, EDITH V[IRGINIA], Fernow Hall, Cornell University, Ithaca, New York 1947
FOLLETT, WILBUR IRVING, 3501 Broadway, Oakland 11, California 1946
FORD, WINFRED N[ATHAN], JR., 31 N. Chenango St., Greene, New York.. 1949
FORDHAM, STEPHEN C[RANE], JR., Delmar Game Farm, Delmar, New York 1946
FORWARD, MRS. TRACY C., Ione, Colorado 1949
FOSSLER, MARY LOUISE, 550 North Los Robles Ave., Pasadena 4, California 1950
L FOSTER, FRANCIS A[PTHORP], Box 31-A, R. R., Vineyard Haven, Massachusetts 1918
FOSTER, [JOHN] BRIS[TOL], 136 Dawlish Ave., Toronto 12, Ontario, Canada 1949
L FOSTER, JOHN HAWLEY, Wayne, Pennsylvania 1927
FOSTER, THOMAS [HENRY], West Rd., Bennington, Vermont 1948
HL FOWLER, HENRY WEED, Academy of Natural Sciences, 19th St. and Parkway, Philadelphia, Pennsylvania 1898
FOX, ADRIAN C[ASPAR], Box 1451, Lincoln, Nebraska 1935
FOX, HENRY, R. R. No. 1, Cape May Court House, New Jersey 1949
FOX, JENNIE ETHEL, Palisades, Rockland Co., New York 1925
FOX, WADE, JR., Department of Zoology, University of Southern California, Los Angeles 7, California 1947
FRANCIS, C. STUART, Spruce Dale Farm, Torch River, Saskatchewan, Canada 1947
FRANCIS, GEORGE R[EID], 382 Hillsdale Ave. E., Toronto 12, Ontario, Canada 1949
FRANZEN, A[LBERT] J[OHN], Chicago Natural History Museum, Chicago 5, Illinois 1934
FRASER, JACK [WILLIAM], 11026—80 Ave., Edmonton [South], Alberta, Canada 1950
FRATES, RODMAN [ANTHONY], 1700 Camden Way, Oklahoma City 6, Oklahoma 1950
FREDERICKSON, RICHARD WILLIAM, 1335 Vermont St., Lawrence, Kansas 1947
FREE, GEORGE J[AMISON], 626 Sunset Rd., State College, Pennsylvania.. 1935
FREEMAN, F[RANK] J[EROME], Itasca, Illinois 1947
FREER, MARIAN F[RANCES], 14 Chouteau St., Missoula, Montana 1949
FRENCH, MRS. ANNA MORTON, 19 Olyphant Pl., Morristown, New Jersey 1946
FRENCH, DR. J. DOUGLAS, 732 Golden West Ave., Arcadia, California.... 1946
FRENCH, MENA VESTAL, [MRS. GEORGE EDWARD], Box 171, Wayland, Massachusetts 1923
L FREY, MRS. EDITH KRIEGER, 814—3rd St., Jackson, Michigan 1923
FREY, EDWARD SNIVELY, 517 Hummel Ave., Lemoyne, Pennsylvania.... 1938
FREYBURGER, WALTER ALFRED, JR., 1522 N. Church St., Kalamazoo, Michigan 1943

FRIEDERS, FABIAN, St. Meinrad's Abbey, St. Meinrad, Indiana..... 1950
FRIEDLANDER, NORMAN, 320 Central Park West, New York 25, New York 1948
FRIEDMAN, RALPH, 14 E. 75th St., New York, New York..... 1921
F FRIEDMANN, HERBERT, Division of Birds, United States National Museum, Washington, D. C.....(1921) 1929
FRIES, WALDEMAR HANS, 220 Valley Rd., Merion Station, Pennsylvania. 1947
FRISTER, CARL P[HILLIP], 2956 A N. 38th St., Milwaukee 10, Wisconsin.. 1950
FRITH, ROWLEY, 65 Butternut Terrace, Ottawa, Ontario, Canada..... 1947
FROHLING, ROBERT C[HARLES], 1218 Plane St., Union, New Jersey..... 1949
FRY, MRS. GLADYS GORDON, 66 Eagle Rock Way, Montclair, New Jersey..... 1925
FRY, J. D., Cornwall Public Library, Cornwall, Ontario, Canada..... 1944
FRY, VARIAN, 56 Irving Pl., New York, New York..... 1946
FRYE, OZRO EARLE, JR., Game and Fresh Water Fish Commission, Tallahassee, Florida..... 1947
FUHRMANN, DR. JOHN B[ARCLAY], 5 Main St., Flemington, New Jersey... 1950
FULLER, C[HARLTON] THOMAS, 557 Howertown Rd., Catasauqua, Pennsylvania..... 1950
FULLER, W[ILLIAM] A[LBERT] [LENNOX], Fort Smith, Northwest Territories, Canada..... 1950
FUNDERBURG, JOHN B[ROADUS], JR., 1211 S. Fourth St., Wilmington, North Carolina..... 1948
FURNISS, OWEN CECIL, Box 756, Alberni, British Columbia, Canada..... 1931
FYFE, RICHARD WILLIAM, Box 311, Kindersley, Saskatchewan, Canada.. 1951
GABORIAULT, VICTOR [THEODORE], St. Viator High School, 7315 De Lanaudiere St., Montreal, Quebec, Canada..... 1950
F GABRIELSON, IRA N[OEL], 1807 Preston Rd., Parkfairfax, Alexandria, Virginia.....(1912) 1938
L GAGE, KATHLEEN R. [MRS. CHAS. E.], 401 Great Falls St., Falls Church, Virginia..... 1943
GAILLARD, STEPHEN LEE, 9 Lee Pl., Bronxville, New York..... 1941
GAINEY, LOUIS FRANKLIN, Box 299, Jupiter, Florida..... 1950
GAIRLOCH, STANLEY S[TANFORD], Kingstowne Rd., Kingston, Rhode Island..... 1947
GALLEY, MRS. AUGUSTA R[ICHMOND], Apt. 6, 3261 Farnam St., Omaha 2, Nebraska..... 1949
GALLEY, JOHN E[DMOND], 1610 W. Holloway Ave., Midland, Texas..... 1949
GALLUP, FRED[ERICK] N[ORMAN], Box 614, Escondido, California..... 1948
GAMMELL, DR. ROBERT T[HEODORE], Kenmare, North Dakota..... 1942
M GANIER, ALBERT F[RANKLIN], 2112 Woodlawn Dr., Nashville, Tennessee.....(1917) 1934
GANTZ, R[OBERT] J. M., R. R. No. 2, Doylestown, Pennsylvania..... 1949
HL GARDINER, CHARLES BARNES, 133 W. Main St., Norwalk, Ohio..... 1903
GARDNER, DANIEL ALEXANDER, 2344 N. W. 14th St., Oklahoma City 7, Oklahoma..... 1946
GARDNER, MERRIEL M[ASLIN] [MRS. I. C.], 12 Shepherd St., Chevy Chase 15, Maryland..... 1943
GARNER, WILLIAM V[AUGHN], 447 E. Wadsworth St., Philadelphia 19, Pennsylvania..... 1948
GARRETT, [MARY] LOIS, 1709 Chestnut St., Kenova, West Virginia..... 1949
GARRISON, DAVID L[LOYD], Silver Hill Rd., Lincoln, Massachusetts..... 1949

GARRISON, ROBERT C[HARLES], Box 834, Punta Gorda, Florida..... 1950
GARRITY, DEVIN A[DAIR], 23 E. 26th St., New York 10, New York..... 1947
GARVAN, MRS. FRANCIS P., 740 Park Ave., New York 21, New York.... 1948
GARY, W[ILBUR] Y[OCUM], Box 1791, Jacksonville 1, Florida..... 1950
GASHWILER, JAY S., Fish and Wildlife Service, 436 Federal Bldg., Salt Lake City, Utah..... 1939
GATES, FRANK WARD R[ISDON], 156 Garfield Rd., West Hartford 7, Connecticut..... 1928
L GAUNTLETT, FREDERIC JOHN, 5802 Kirkside Dr., Chevy Chase 15, Maryland..... 1925
GAUTHEY, J. RICHARD, Wilton-Westport Rd., Wilton, Connecticut..... 1950
GENSCH, ROBERT H[ENRY], Fish and Wildlife Service, 1001 Fidelity Bldg., Kansas City 6, Missouri..... 1938
GEORGE, JOHN L[OTHAR], Division of Conservation, Vassar College, Poughkeepsie, New York..... 1950
GERDES, MRS. WILLIAM FREDERICK, JR., 2111 Aldo Blvd., Quincy, Illinois. 1948
GERRY, ELOISE, 1105 Dartmouth Rd., Shorewood Hills, Madison 5, Wisconsin..... 1949
GERSTELL, RICHARD, 355 N. West End Ave., Lancaster, Pennsylvania... 1939
GIBBS, C[ARLIN] F., 3069 Orchard Rd., Silver Lake, Cuyahoga Falls, Ohio. 1949
GIBBS, HAROLD N., A–71 Sowams Rd., Barrington, Rhode Island..... 1939
GIBBS, ROBERT HENRY, JR., 114 W. Thornapple St., Chevy Chase, Maryland..... 1947
GIBSON, GEORGE G[ORDON], 265 Sheldrake Blvd., Toronto 12, Ontario, Canada..... 1949
GIBSON, R[OBERT] H[OWARD], Box 336, R. R. No. 2, St. Helena, California. 1948
GIER, HERSCHEL T[HOMAS], Department of Zoology, Kansas State College, Manhattan, Kansas..... 1937
GIER, LELAND J[ACOB], William Jewel College, Liberty, Missouri..... 1942
GIESLER, J[OHN] CALVIN, R. R. No. 1, Payette, Idaho..... 1950
GIFFORD, DR. HAROLD, 3636 Burt St., Omaha 3, Nebraska..... 1946
GIFT, ROBERT F[RANKLIN], 935 Washington Ave., Lewisburg, Pennsylvania..... 1950
GILBERT, PERRY W[EBSTER], Zoology Department, Cornell University, Ithaca, New York..... 1939
GILES, NORMAN H[ENRY], JR., Osborn Botanical Laboratory, Yale University, New Haven, Connecticut..... 1930
GILL, GEOFFREY, 24 Overlook Dr., Huntington, Long Island, New York.. 1940
GILLEN, HAROLD W., c/o Gillen and Company, 120 Broadway, New York City 5, New York..... 1950
M GILLIARD, E[RNEST] THOMAS, American Museum of Natural History, Central Park West at 79th St., New York 24, New York...(1938) 1950
GILLIN, JAMES R., Ambler Nurseries, Ambler, Pennsylvania..... 1945
GLATFELTER, ALFRED E., Hampden DuBose Academy, Zellwood, Florida.. 1949
GLENN, ROBERT W[YCKOFF], 509 Orchard Ave., Avalon, Pittsburgh 2, Pennsylvania..... 1937
GLENNY, FRED H., 1148 Linden Ave., Akron 10, Ohio..... 1947
GLICK, BRUCE, 103 Franklin Ave., Margate, New Jersey..... 1948
GLOVER, FRED A[RTHUR], Division of Natural Science, Humboldt State College, Arcata, California..... 1945

GLOYD, HOWARD K[AY], Chicago Academy of Sciences, 2001 N. Clark St., Chicago 14, Illinois 1939
M GODFREY, W[ILLIAM] EARL, National Museum of Canada, Ottawa, Ontario, Canada ..... (1942) 1949
GOEBEL, HERMAN, 78–52 80th St., Brooklyn 27, New York 1947
GOELITZ, WALTER A[DOLPH], Milford, Pennsylvania 1916
GOETHE, C. M., Capital National Bank Bldg., 7th and "J" Sts., Sacramento 14, California 1947
GOETZ, CHRISTIAN J[OHN], 3503 Middleton Ave., Cincinnati, Ohio 1929
GOFF, MILTON R[EEDER], 405 Westchester Ave., Rochester 9, New York. 1949
GOLDMAN, GEORGE M., 1755 N. Decatur Rd., N. E., Atlanta, Georgia ... 1949
GOLDMAN, LUTHER CHASE, Fish and Wildlife Service, San Benito, Texas. 1947
GOLDSTEIN, HARRY B[ARUCH], 5939 Addison St., Philadelphia 43, Pennsylvania 1947
GOLLOP, J[AMES] BERNARD, Canadian Wildlife Service, University of Saskatchewan, Saskatoon, Saskatchewan, Canada 1947
M GOOD, ALBERT I., 819 Quinby Ave., Wooster, Ohio ..... (1939) 1948
GOOD, WALLACE M., 3 Reidcrest, Kansas City, Kansas 1949
GOODGE, WILLIAM [R.], 1111—38th Ave., Seattle 22, Washington 1949
GOODMAN, MRS. JEANNE MOORE, Department of Zoology, University of Michigan, Ann Arbor, Michigan 1947
GOODPASTURE, KATHERINE ANDERSON, [MRS. ERNEST W.], 408 Fairfax Ave., Nashville 5, Tennessee 1950
GOODRIDGE, EDWIN T., Province Line Rd., Princeton, New Jersey 1946
GOODWILL, E. V., Hydrographic Service, Department of Mines and Technical Surveys, Ottawa, Ontario, Canada 1942
GOODWIN, MISS MARGARET S., Earnley, R. R. No. 5, West Chester, Pennsylvania 1942
GORDON, HARRY E[DGAR], 307 Laburnum Crescent, Rochester, New York. 1911
GORDON, SETH E[DWIN], Ferry Bldg., c/o Division of Fish and Game, San Francisco, California 1924
GORSKI, DOLORES C[ONWILL], Bandera, Texas 1950
GOSLIN, CHARLES R[USSELL], 726 E. King St., Lancaster, Ohio 1936
GOSLIN, ROBERT M[ARTIN], 316 Wilson Ave., Columbus 5, Ohio 1947
GOTTSCH, WERNER H[ENRY], 8110 Cargill, Houston 15, Texas 1948
GRABER, RICHARD REX, 2201 Washburn Ave., Topeka, Kansas 1948
GRACE, LUCILE C. [MRS. C. J.], Hilton's Rd., Slingerlands, New York ... 1944
GRAHAM, HATCH, 1106 Hall of Records, Los Angeles 12, California 1947
GRAHAM, HATCH, JR., 10300 Viretta Lane, Los Angeles 24, California 1950
GRAHAM, DR. JOHN C[OOPER], 80 Hanson Pl., Brooklyn 17, New York ... 1949
GRANATH, MISS EDNA B[ECHER], 706 School St., Webster, Massachusetts. 1947
GRANGE, WALLACE, Sandhill Game Farm, Inc., Babcock, Wisconsin 1923
GRANT, DR. ADELE LEWIS, 6019 S. Overhill Dr., Los Angeles 43, California. 1947
GRANT, CLEVELAND P[UTNAM], 245 Davis St., Mineral Point, Wisconsin .. 1924
GRANT, ROBERT H., 2415 Newkirk Ave., Brooklyn, New York 1943
GRAY, ALVIN EVERETT, 1912 N. W. 21st St., Oklahoma City, Oklahoma .. 1923
GRAYCE, ROBERT, 141 Main St., Rockport, Massachusetts 1947
GREELEY, FREDERICK, University Houses 15–B, Eagle Heights, Madison 5, Wisconsin 1948
L GREEN, MORRIS MILLER, 39 Wyoming Ave., Ardmore, Pennsylvania 1921
GREEN, N[ORMAN] BAYARD, Marshall College, Huntington, West Virginia. 1946

M GREENE, EARLE ROSENBURG, 534 "D" St., Oxnard, California.....(1921) 1942
GREENE, DR. ROBERT A[LONZO], 11 2nd St., Geneseo, New York..... 1948
GREENHALGH, CLIFTON M., 1230 E. 1st St. S., Salt Lake City, Utah..... 1944
HL GREENOUGH, HENRY V[OSS], 39 Worthington Rd., Brookline, Massachusetts..... 1901
GREENWALT, ERNEST J[AGGER], Wichita Mountains Wildlife Refuge, Cache, Oklahoma..... 1932
GREENWALT, LEON, Box 274, Goshen, Indiana..... 1949
F GREENWAY, JAMES COWAN, JR., Museum of Comparative Zoology, Cambridge, Massachusetts.....(1930) 1948
GREGORY, ROBERT, R. R. No. 1, Mooresville, Indiana..... 1947
M GREGORY, STEPHEN S[TRONG], JR., Box N, Winnetka, Illinois.....(1906) 1934
GREGORY, TAPPAN, 105 S. LaSalle St., Chicago, Illinois..... 1931
GRESHAM, HENRY L[INDSAY], 38 Morton St., New York 14, New York... 1947
GRIERSON, STANLEY [OLIVER], 44 Sunrise Ave., Katonah, New York.... 1943
GRIFFEE, W[ILLET] E., 580 Yeon Bldg., Portland 4, Oregon..... 1944
M GRIFFIN, DONALD R[EDFIELD], Department of Zoology, Cornell University, Ithaca, New York.....(1936) 1947
GRIFFIN, WILLIAM W[ELCOME], 211 N. Madison St., College Park, Georgia. 1946
GRIFFING, PHILLIP [SCHERER], 1210 Larchmont Lane, Oklahoma City 6, Oklahoma..... 1949
GRIMES, SAMUEL A[NDREW], 4627 Peachtree Circle E, Jacksonville, Florida. 1925
GRIMM, WILLIAM C[AREY], Pocono Lake, Pennsylvania..... 1943
GRINNELL, HILDA WOOD [MRS. JOSEPH], 3016 Benvenue Ave., Berkeley 5, California..... 1931
L GRINNELL, LAWRENCE I[RVING], 710 Triphammer Rd., Ithaca, New York. 1938
F GRISCOM, LUDLOW, Museum of Comparative Zoology, Cambridge, Massachusetts.....(1908) 1925
GRISWOLD, JOHN AUGUSTUS, JR., West Valley Rd., Strafford, Wayne, Pennsylvania..... 1933
GROESBECK, WILLIAM M[AYNARD], 376 Seneca Rd., Hornell, New York.. 1949
GROFF, MISS FRANCES L[LOYD], Chester Heights, Pennsylvania..... 1929
M GROMME, OWEN J[USTUS], Public Museum, Milwaukee, Wisconsin.(1924) 1939
M GROSKIN, HORACE, 210 Glenn Rd., Ardmore, Pennsylvania.....(1935) 1950
F GROSS, ALFRED OTTO, 11 Boody St., Brunswick, Maine.....(1907) 1930
GRUBE, GEORGE E[DWARD], Biology Department, Gettysburg College, Gettysburg, Pennsylvania..... 1943
GRUENEWALD, ROBERT F[RANKLIN], Box 422, Sanborn, Iowa..... 1948
GUDMUNDSSON, FINNUR, Natturugripasafnid (Museum of Natural History), Box 532, Reykjavik, Iceland..... 1949
L GUERNSEY, RAYMOND G[ANO], Eden Terrace, Poughkeepsie, New York.. 1928
L GUILD, EASTHAM, Box 56, Papeete, Tahiti..... 1930
GULLION, GORDON W[RIGHT], 624 Ave. "I" Boulder City, Nevada..... 1946
GUMBART, WILLIAM B., 205 Church St., New Haven 9, Connecticut..... 1948
GUNDERSON, HARVEY L[ORRAINE], Museum of Natural History, University of Minnesota, Minneapolis 14, Minnesota..... 1947
GUNN, W[ILLIAM] W[ALKER] H[AMILTON], 178 Glenview Ave., Toronto 12, Ontario, Canada..... 1935
GUNTER, GORDON, Institute of Marine Science, Port Aransas, Texas..... 1948
GUTHRIE, DR. DONALD, Robert Packer Hospital, Sayre, Pennsylvania... 1930
HAGAR, MRS. JACK [JOHN DAVID], Rockport, Texas..... 1937

M HAGAR, JOSEPH A[RCHIBALD], Marshfield Hills, Massachusetts....(1935) 1939
HAGENSTEIN, WALTER M., Medina, Washington..... 1946
HAGOPIAN, RALPH, 114 E. 90th St., New York 28, New York..... 1946
HAGUE, MISS FLORENCE S[ANDER], Sweet Briar College, Sweet Briar, Virginia..... 1930
HAINES, ROBERT L[EE], 54 E. Main St., Moorestown, New Jersey..... 1924
HALBERG, MRS. HENRY N., 136 Arborway, Jamaica Plain 30, Massachusetts..... 1947
HALEY, RONALD HUESTIS, 40 Harding Ave., Belmont 78, Massachusetts.. 1946
HALL, EDWARD M[cMURTRY], 7620 S. College Ave., Whittier, California.. 1947
HALL, E[UGENE] RAYMOND, Museum of Natural History, University of Kansas, Lawrence, Kansas..... 1938
HALL, FRED T., Davenport Public Museum, 704 Brady St., Davenport, Iowa..... 1939
HALL, GEORGE A[RTHUR], Department of Chemistry, University of West Virginia, Morgantown, West Virginia..... 1949
HALL, WILLIS, 1111 Douglas Ave., Yankton, South Dakota..... 1948
HALLE, LOUIS J[OSEPH], JR., 2831 Chesterfield Pl., N. W., Washington 8, D. C..... 1934
HALLER, FRANK D[ENVER], 235 E. Mechanic St., Bloomfield, Indiana.... 1941
HALLER, KARL W[ILLIAM], 1099 National Rd., Wheeling, West Virginia.. 1949
HALLMAN, R[OY] C[LINE], Box 435, Port St. Joe, Florida..... 1928
HALLORAN, ARTHUR F[RANKLIN], Box 1032, 661 7th Ave., Yuma, Arizona 1949
HALVERSON, ARTHUR W[ILLIAM], 5705 W. Erie St., Chicago 44, Illinois... 1950
HAMBLETON, MISS JESSIE VIRGINIA, 36 Meadowvale Ave., Cliffcrest P. O., Ontario, Canada..... 1947
M HAMERSTROM, F[REDERICK] N[ATHAN], JR., R. R., Plainfield, Wisconsin (1939) 1941
HAMILTON, ARTHUR LINCOLN, 836 N. Raymond Ave., Pasadena 3, California..... 1950
HAMILTON, CHARLES W[HITELEY], 2639 Fenwood, Houston 5, Texas..... 1947
HAMILTON, G[OLDEN] DALE, 2550 Murray St., Shreveport 51, Louisiana.. 1949
HAMILTON, W[ILLIAM] J[OHN], JR., Department of Conservation, Cornell University, Ithaca, New York..... 1924
HAMLETT, PAUL DOUGLAS, R. R. No. 1, Adams, Tennessee..... 1947
HAMMER, HERBERT B[ERGER], Queen Charlotte City, British Columbia, Canada..... 1947
HAMMOND, EDWARD K[ING], 10828 S. Hoyne Ave., Chicago 43, Illinois... 1937
HAMMOND, GEORGE H., White Grub Laboratory, Marmora, Ontario, Canada..... 1947
HAMMOND, MERRILL C[LYDE], Lower Souris Refuge, Upham, North Dakota..... 1937
HAMMOND, ROLAND, 41 Boylston Ave., Providence, Rhode Island..... 1924
HAMNETT, WILLIAM L[AWRENCE], 2809 Kittrell Dr., Raleigh, North Carolina..... 1937
HAMPE, IRVING EDWARD, 5559 Ashbourne Rd., Baltimore 27, Maryland.. 1933
HAMRUM, CHARLES LOWELL, Department of Biology, Gustavus Adolphus College, St. Peter, Minnesota..... 1948
HANCOCK, JAMES W[ILLIAM], R. R. No. 1, Madisonville, Kentucky..... 1947
HAND, RALPH L[EVI], 543 S. 5th St. West, Missoula, Montana..... 1929

HANDLEY, CHARLES OVERTON, JR., 6571 Roosevelt Ave., Charleston, West Virginia 1941
M HANDLEY, CHARLES OVERTON, SR., 6571 Roosevelt Ave., Charleston, West Virginia ..... (1916) 1948
HANDLEY, JOHN MCNEEL, 6571 Roosevelt Ave., Charleston, West Virginia 1947
M HANN, HARRY W[ILBUR], Zoology Department, University of Michigan, Ann Arbor, Michigan ..... (1930) 1942
HANNA, G. DALLAS, California Academy of Sciences, San Francisco, California 1930
HANNA, WILSON CREAL, 712 N. Eighth St., Colton, California 1919
HANNEMANN, MRS. PAUL F., 22 Fern St., Bangor, Maine 1947
HANSMAN, ROBERT H[ERBERT], 1215 Ave. "F," Fort Madison, Iowa 1948
HANSON, E[LMER] C[HARLES], 1305 Wisconsin Ave., Racine, Wisconsin 1940
HANSON, HAROLD C[ARSTEN], Illinois Natural History Survey, Natural Resources Bldg., Urbana, Illinois 1937
HANSON, ROSSALIUS C[HRIST], Box 311, R. R. No. 1, Willows, California 1950
HANSON, THOMAS [LYMAN], 3929 Cochran St., Erie, Pennsylvania 1949
HANSON, WILLIAM RODERICK, Southern Great Plains Field Station, Woodward, Oklahoma 1947
HARBESON, BEN, R. R. No. 4, Paris, Kentucky 1948
HARDER, RICHARD C[HARLES], Matfield Green, Kansas 1949
HARDY, FREDERICK C., Greenwood, Kentucky 1949
HARDY, ROSS, Long Beach State College, 5400 E. Anaheim St., Long Beach 3, California 1938
HARFORD, DR. HENRY M[INOR], 926 Argyle Bldg., Kansas City, Missouri 1939
HARGRAVE, LYNDON LANE, Box 505, Benson, Arizona 1950
L HARLEY, JAMES BICKEL, R. R. No. 1, Pottstown, Pennsylvania 1946
HARLLEE, H[ARRY] L[EE], 1301 W. Palmetto St., Florence, South Carolina 1932
HARMON, J[OHN] WILLIAM, 5520 N. W. 10th St., Oklahoma City 7, Oklahoma 1937
HARLOR, JOHN CLAYTON, 2859 Powell Ave., Columbus 9, Ohio 1948
HLM HARPER, FRANCIS, R. R. No. 1, Mount Holly, New Jersey ..... (1907) 1917
HARPHAM, MISS PRISCILLA G., 3661 Tantalus Dr., Honolulu 13, Hawaii 1950
HARRELL, BYRON E[UGENE], 1594 Stanford Ave., St. Paul, Minnesota 1939
HARRINGTON, PAUL, 813 Bathurst St., Toronto, Ontario, Canada 1922
HARRIOT, SAMUEL C[ARMAN], 200 W. 58th St., New York, New York 1934
HARRIS, DR. ARTHUR TREVENNING, 4635 Ledge Ave., North Hollywood, California 1950
HARRIS, BRUCE K., Department of Game and Fish, Division of Federal Aid, Bismarck, North Dakota 1947
LM HARRIS, HARRY, 5234 Hermosa Ave., Eagle Rock, California ..... (1911) 1919
HARRIS, MRS. HUGH H[ENRY], Emory University, Box 686, Atlanta, Georgia 1934
HARRIS, LUCIEN, JR., 61 Clarendon Ave., Avondale Estates, Georgia 1930
HARRIS, DR. STUART K[IMBALL], 33 Lebanon St., Winchester, Massachusetts 1940
HARRIS, WILLIAM GEO[RGE] F[OWLE], 147 Hillside St., Milton 86, Massachusetts 1933
L HARRIS, WILLIAM P[ICKETT], JR., 309 Rivard Blvd., Grosse Pointe 30, Michigan 1925

L HARRISON, ED N[EWTON], Box B-10, Encinitas, California..... 1934
L HARRISON, GEO. L[EIB], 1128 Fidelity-Philadelphia Trust Bldg., 123 S. Broad St., Philadelphia 9, Pennsylvania..... 1919
HARRISON, HAL H., 1102 Highland St., Tarentum, Pennsylvania..... 1944
HARROWER, DR. D[AVID] E[LSON], Newtown, Connecticut..... 1933
HART, W[ILLIAM] STEPHEN, Box 1185, Montreal, Quebec, Canada..... 1926
HARTLEY, A[LBERT] T[HOMAS], R. R. No. 2, Columbiana, Ohio..... 1949
HARTMAN, FRANK A[LEXANDER], Hamilton Hall, Ohio State University, Columbus, Ohio..... 1941
HARTMAN, ROLAND O[SCAR], 4387 W. 63rd St., Cleveland 9, Ohio..... 1949
HARTSHORNE, JAMES MOTT, c/o General Delivery, Quantico, Virginia.... 1946
HARTWELL, REGINALD W[ARNER], 121 N. Fitzhugh St., Rochester 14, New York..... 1949
HARWELL, CHARLES ALBERT, 2630 Hilgard Ave., Berkeley, California.... 1943
HASBROUCK, EDWIN M[ARBLE], 4909 14th St., N. W., Washington, D. C. 1939
HASBROUCK, HENRY C[RANE], 88 Douglas Rd., Glen Ridge, New Jersey.. 1920
HASTINGS, E[DWARD] EARNSHAW, 505 Oakley Rd., Haverford, Pennsylvania..... 1946
HASTINGS, LINNAEUS R[OY], 121 14th St., Pacific Grove, California..... 1950
HATCH, MISS [CLARA] GRENVILLE, 1548 Wilhelmina Rise, Honolulu 17, Hawaii..... 1950
HATCH, ROBERT [MCCONNELL], 21 Church St., Waterbury 5, Connecticut 1949
HL HAVEMEYER, H[ENRY] O[SBORNE], Mahwah, New Jersey..... 1893
HAWBECKER, ALBERT C[LAUDE], Fresno State College, Fresno, California.. 1947
HAWKINS, L[ESLIE] G., Box 1663, Los Alamos, New Mexico..... 1947
HAWKINS, NAOMI M., Alma, Illinois..... 1947
HAWKINS, ROLAND WALTER, Division of Ornithology, Carnegie Museum, Pittsburgh, Pennsylvania..... 1946
HAWKSLEY, OSCAR, Central Missouri State College, Warrensburg, Missouri. 1943
HAYDEN, H[OLLIS] VINCENT, 157 Hobart St., Danvers, Massachusetts... 1949
HAYDOCK, EDWARD L[AURENCE], Box 267, Luanshya, Northern Rhodesia, Africa..... 1948
HAYNE, DON W[ILLIAM], Department of Zoology, Michigan State College, East Lansing, Michigan..... 1950
HAYNES, RAY F., 65 Chateau Terrace, Snyder 21, New York..... 1949
HAYNESWORTH, W[ILLIAM] F[RANCIS] B[AKER], 103 E. Calhoun St., Sumter, South Carolina..... 1950
HAYS, EVA H., 11 Dorman Rd., Morningside, Wheeling, West Virginia.. 1944
HAZEN, MISS ANNE W[RIGHT], 24 Charles Hill Rd., Orinda, California... 1949
HEALY, JOSEPH F[RANCIS], 3520 N. Paulina St., Chicago 13, Illinois..... 1950
HEAPS, MISS PEARL, 1916 Park Ave., Baltimore 17, Maryland..... 1948
HEATH, REGINALD, 10532–128 St., Edmonton, Alberta, Canada..... 1950
HEBARD, FREDERICK V[ANUXEM], 1500 Walnut St. Bldg., Philadelphia, Pennsylvania..... 1930
HEBDITCH, G[ERALD] A[UBREY], 92 Rydes Hill Rd., Guildford, Surrey, England..... 1949
HECK, DR. EDSON [BURR], 325 E. 72nd St., New York, New York..... 1936
HECKLER, SYDNEY B., 1207 N. 7th St., St. Louis 6, Missouri..... 1948
HEDGES, HAROLD C[HARLES], R. R. No. 2, Quivira Lake, Kansas City 3, Kansas..... 1946

HEED, WILLIAM B[ATTLES], Church St. and Virginia Ave., West Chester, Pennsylvania 1945
HEFLEY, HAROLD M[ARTIN], Division of Biological Sciences, Mississippi Southern College, Station A, Hattiesburg, Mississippi 1947
HEGNER, FRANK ARNOLD, 727 Broad St., Sewickley, Pennsylvania 1924
HEILBORN, [KLAUS] AXEL, 8874 Lindbergh Ave., Niagara Falls, New York. 1949
HEISER, JOSEPH M[ATHEW], JR., 1724 Kipling St., Houston 6, Texas 1939
HEISER, MISS MINNIE, 2611 Elisha Ave., Zion, Illinois 1947
HELFER, MISS LOUISE, 111 9th St., Watkins Glen, New York 1929
HELLEINER, FREDERICK M[ARIA], 207 Cottingham St., Toronto 5, Ontario, Canada 1947
HEMPHILL, [JOHN] MARSHALL, 1444 Shore Rd., Linwood, New Jersey 1949
HENDERSON, MRS. ALEXANDER, 337 Aycrigg Ave., Passaic, New Jersey .. 1946
HENDERSON, ARCHIBALD DOUGLAS, Belvedere, Alberta, Canada 1949
HENDRICKS, GENE THOMPSON [MRS. PHILIP], 900 S. Robberson Ave., c/o C. E. Thompson, Springfield 4, Missouri 1947
HENDRICKS, G[EORGE] BARTLETT, 88 Fort Hill Ave., Pittsfield, Massachusetts 1935
HENDRICKSON, GEORGE O[SCAR], Department of Zoology and Entomology, Iowa State College, Ames, Iowa 1943
HENGST, MRS. JAMES R., 2111 Parkhill Dr., Columbus 9, Ohio 1948
HENNEY, MRS. NELLA B[RADDY], 111 5th St., Garden City, New York .. 1950
HENRY, CORDIA J[OHN], Seney National Wildlife Refuge, Germfask, Michigan 1934
HENSLEY, M[ARVIN] MAX, Laboratory of Ornithology, Fernow Hall, Cornell University, Ithaca, New York 1949
HENWOOD, MRS. ETHEL M., 806 S. Lincoln, Urbana, Illinois 1947
HERBERGER, JOSEPH THOMAS, 959 S. Downing, Denver 9, Colorado 1949
HERBERT, RICHARD A., 961 Fox St., New York, New York 1946
HERBST, MRS. THEODORE WILHELM, Faircourt, Bernardsville, New Jersey. 1931
HERMES, ROBERT C[ARLYLE], 205 N. Park Ave., Buffalo 16, New York .. 1949
HERNDON, LEE R., 1533 Burgie Pl., Elizabethton, Tennessee 1946
M HERSEY, F[RANK] SEYMOUR, Bay Rd., Easton, Massachusetts .... (1911) 1916
HERSHEY, MISS CLARA L[OUISE], 168 Lincoln St., Steelton, Pennsylvania. 1937
HEWITT, Marvin Ward, Railroad Ave., Greensboro, Maryland 1949
HEWITT, OLIVER H[AROLD], Department of Conservation, Fernow Hall, Cornell University, Ithaca, New York 1944
HEYWOOD, PHILIP B., 332 Main St., Worcester 8, Massachusetts 1947
HIATT, ROBERT W[ORTH], Department of Zoology, University of Hawaii, Honolulu, Hawaii 1943
HIBBARD, MISS GLADYS EVADNE, Chambly Canton, Quebec, Canada 1947
L HIBBERT, MRS. HAROLD, Box 1728, New Haven 7, Connecticut 1926
M HICKEY, JOSEPH J[AMES], 424 University Farm Pl., Madison 5, Wisconsin (1936) 1940
HICKEY, MARGARET [MRS. JOSEPH JAMES], 13-A, Eagle Heights, Madison 5, Wisconsin 1933
HICKMAN, MRS. HERBERT AUSTIN, 797 Bird Ave., Buffalo 9, New York .. 1947
LF HICKS, LAWRENCE EMERSON, 8 Chatham Rd., Columbus 2, Ohio ... (1929) 1941
L HICKS, THOMAS W[ILLIAM], 5625 Alta St., Jacksonville 6, Florida 1948
HIGGINBOTHAM, SIBLEY, 17 Winthrop Ave., Wollaston 70, Massachusetts. 1950
HIGGINS, HAROLD G., 2965 S. 14th E., Salt Lake City, Utah 1943

HIGGINS, ROBERT C[LINTON], 131 W. 8th Ave., Columbus, Ohio..... 1950
HIGGINS, THOMAS F[RANCIS], 32–73 43rd St., Astoria 3, New York..... 1947
HIGHLEY, SEWARD [TRAINER], 43 Powder House Rd., Medford 55, Massachusetts..... 1949
HIGMAN, H[ARRY] W[ENTWORTH], 1320 E. 63rd St., Seattle, Washington.. 1938
HILDEBRAND, RICHARD D., Box 521, Del Rio, Texas..... 1950
HILDRETH, MISS MARY A[LICE], Park St., Haverhill, New Hampshire.... 1947
HILL, DR. HAROLD M[ERRILL], 229 Cajon St., Redlands, California..... 1947
HILL, HERBERT, 61 Irving Pl., New York 3, New York..... 1942
HILL, JULIAN W[ERNER], 1106 Greenhill Ave., Wilmington, Delaware.... 1934
HILL, NORMAN P[IERCE], 75 Fair St., Cooperstown, New York..... 1943
HILL, RAYMOND WARD, 3316 Kenmore Rd., Shaker Heights 22, Ohio.... 1947
HILTON, MRS. DAVID C., 2500 Woodsnest Ave., Lincoln, Nebraska..... 1947
HILTON, FREDERICK KELKER, 5544 Midwood Ave., Baltimore 12, Maryland..... 1951
HINCHMAN, RICHARD M[AY], 75 Fairbanks Rd., Milton, Massachusetts.. 1930
HINDS, FRANK J., Department of Biology, Western State Teachers College, Kalamazoo, Michigan..... 1935
HINES, JOSEPH [AUSTIN], 30–12 49th St., Long Island City 3, New York.. 1947
HINES, MARGARET KATHERINE, 4905 Edmonston Ave., Hyattsville, Maryland..... 1947
HINSHAW, THOMAS D[OANE], 1827 San Juan Ave., Berkeley 7, California. 1930
HIPPLE, BYRON T[HOMAS], JR., 46 Dove St., Albany 6, New York..... 1949
HITCHCOCK, HAROLD B[RADFORD], Department of Biology, Middlebury College, Middlebury, Vermont..... 1939
HOBSON, MRS. DOROTHY MADDEN, Apt. 39, 1309 N. Pennsylvania St., Indianapolis 2, Indiana..... 1948
LM HOCHBAUM, HANS ALBERT, Delta, Manitoba, Canada.....(1942) 1945
HOCK, RAYMOND J., Arctic Health Research Center, U. S. Public Health Service, Box 960, Anchorage, Alaska..... 1946
HODELL, ADAH R[IFE], 2026 Ponce de Leon Ave., West Palm Beach, Florida..... 1949
HODGES, JIM [JAMES], 324 W. 31st St., Davenport, Iowa..... 1946
HOFFMAN, DONALD M[ILTON], 2906 Stuart St., Denver 12, Colorado..... 1948
HOFFMAN, MRS. MARY, Apt. 7, 242 Huron St., London, Ontario, Canada. 1948
HOFFMEISTER, LINUS C[HRISTIAN], 504 W. Ripa, Lemay 23, Missouri.... 1939
HOFSLUND, PERSHING B[ERNARD], Biology Department, Duluth Branch, University of Minnesota, Duluth, Minnesota..... 1948
HOLCOMBE, ALEXANDER H., JR., 2222 Arch St., Philadelphia 3, Pennsylvania..... 1949
HOLDOM, M[ARTIN] W[EBBER], Lindsay Cottage, Crescent, British Columbia, Canada..... 1950
HOLGERSEN, HOLGER, Stavanger Museum, Stavanger, Norway..... 1949
HOLLAND, GEORGE [KARL], 189 Park Row, Hamilton, Ontario, Canada.. 1950
HOLLAND, HAROLD MAY, Box 615, Galesburg, Illinois..... 1910
HOLLERITH, RICHARD, 307 Shrewsbury Rd., Riverton, New Jersey..... 1946
HOLLISTER, J. M., 1302 Stratford Rd., Schenectady 8, New York..... 1947
HOLLOM, P[HILIP] A. D., Manor Cottage, Park Rd., Woking, Surrey, England..... 1942
HOLMAN, JOHN P[AULISON], Fairfield, Connecticut..... 1922

HOLMAN, ROBERT C[HARLES], Biology Department, Westmont-Upper Yoder High School, Johnstown, Pennsylvania 1947
HOLMBERG, MISS SEVERENA C[AROLINE], 4827 Woodlawn Blvd., Minneapolis 17, Minnesota 1949
HOLMES, JOHN WM., Box 49, Rydal, Pennsylvania 1949
HOLMES, DR. WILLIAM H., R. R. No. 4, Barrington, Illinois 1942
M HOLT, ERNEST G[OLSON], c/o American Embassy, Tegucigalpa, Honduras (1911) 1925
HOLTON, MRS. CHARLES W. [LOUISE D.], Essex Fells, New Jersey 1946
HONAMAN, MRS. R. KARL, 2 Cambridge Rd., Glen Ridge, New Jersey 1949
HOPE, CLIFFORD E., Royal Ontario Museum of Zoology, 100 Queen's Park Dr., Toronto, Ontario, Canada 1947
HOPKINS, MILTON N[EWTON], JR., 108 N. Merrimac Dr., Fitzgerald, Georgia 1950
HORENSTEIN, BETTY R., Department of Psychology, Duluth Branch, University of Minnesota, Duluth, Minnesota 1950
HORSEY, R[ICHARD] E[DGAR], 320 Eaglehead Rd., East Rochester, New York 1919
HORSKY, L[EWIS] O[TTO], 5952 Franklin St., Omaha 4, Nebraska 1948
HOSTETTER, D[AVID] RALPH, Eastern Mennonite College, Harrisonburg, Virginia 1937
HOUGH, JOHN N[EWBOLD], 1515 Mariposa Ave., Boulder, Colorado 1946
HOUGH, MRS. MARY Y[EAGER], 27 North Dr., Lawrence Brook Manor, New Brunswick, New Jersey 1949
HOUSTON, C[LARENCE] STUART, Box 279, Yorkton, Saskatchewan, Canada 1943
F HOWARD, HILDEGARDE, [MRS. H. ANSON WYLDE], Los Angeles Museum, Exposition Park, Los Angeles, California ..... (1928) 1946
HOWE, H[ENRY] BRANCH, JR., 414 West Ponce de Leon Ave., Decatur, Georgia 1943
LM HOWELL, A[LFRED] BRAZIER, Alna, Maine ..... (1909) 1916
M HOWELL, JOSEPH C[ORWIN], Zoology and Entomology Department, University of Tennessee, Knoxville, Tennessee ..... (1928) 1949
HOWELL, MISS THELMA, Wesleyan College, Macon, Georgia 1947
HOWELL, THOMAS R[AYMOND], Department of Zoology, University of California, Los Angeles 24, California 1948
HOWSLEY, L[UCIEN] R[EEDER], 435 W. 106 St., Los Angeles 3, California .. 1950
HOVEY, P[ERCY] L[EONARD], Brookgreen Gardens, Georgetown, South Carolina 1947
HOY, NELSON D., 500 Sharon Ave., Sharon Hill, Pennsylvania 1943
HOYT, SARAH ELIZABETH [MRS. J. SOUTHGATE Y.], Fernow Hall, Cornell University, Ithaca, New York 1940
HUBBS, CARL L[EAVITT], Scripps Institution of Oceanography, La Jolla, California 1947
HUBBS, EARL LEAVITT, Box 109, La Jolla, California 1948
HUBER, MRS. WHARTON, Littlebrook Farm, R. R. No. 2, Pottstown, Pennsylvania 1926
HUBERT, PHILIP A[RTHUR], JR., P. O. Box 618, Bellport, Long Island, New York 1949
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M HUEY, LAURENCE M[ARKHAM], Natural History Museum, Balboa Park, San Diego, California ..... (1920) 1932

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HUGHES, DR. S[HELBY] B[OND], 521 E. Jefferson St., Clinton, Missouri.... 1949
HUGHES, WALLACE, 624 S. W. 51st St., Oklahoma City, Oklahoma..... 1947
HUGHES, WALTER WEMYSS, Embro, Ontario, Canada..... 1947
HULBERT, LLOYD [CLAIR], Box 901, College Station, Pullman, Washington 1939
HUMPHREY, MRS. H[ARRY] B[AKER], Cabin John, Maryland..... 1933
HUMPHREY, JAMES [RAE], 3495 W. 30th Ave., Denver 11, Colorado..... 1949
HUMPHREY, PHILIP STRONG, Museum of Zoology, University of Michigan, Ann Arbor, Michigan..... 1947
HUMPHREYS, MRS. DAPHNE M., 2351 Demington Dr., Cleveland Heights, Cleveland, Ohio..... 1950
HUNGERFORD, KENNETH E., School of Forestry, University of Idaho, Moscow, Idaho..... 1946
HL HUNN, JOHN T[OWNSEND] SHARPLESS, 1218 Prospect Ave., Plainfield, New Jersey..... 1895
HUNNEWELL, MISS LOUISA, 848 Washington St., Wellesley, Massachusetts 1936
HUNT, MISS HELEN C[UMMINGS], Washington, Connecticut..... 1928
HUNT, MRS. WILLIAM L[UTHER], 709 14th St., S. E., Washington 3, D. C. 1950
HUNTER, EARLE B[EE], JR., 655 McWhorter Dr., Athens, Georgia..... 1950
HUNTINGTON, CHARLES E[LLSWORTH], 38 Kildeer Rd., Hamden 14, Connecticut..... 1949
HURLBURT, DR. WILLIAM ELLIS, Vineland, Ontario, Canada..... 1949
HURLBUTT, MISS CATHERINE A., 1910 S. Marion St., Denver 10, Colorado 1947
HURLBUTT, MISS HAZEL L., Box 246, R. R. No. 1, Waukegan, Illinois.... 1949
HURLEY, JOHN BEATTY, 401 S. 17th Ave., Yakima, Washington..... 1946
HURST, MRS. MINOR A[RDMORE], 5219 Young St., Houston 9, Texas..... 1948
HUTCHINSON, ARTHUR E[MLEN], 2640 Glendessary Lane, Santa Barbara, California..... 1940
HUTCHISON, R[OBERT] B[OSWORTH], 1719 Marine St., Boulder, Colorado.. 1950
HUTT, F[REDERICH] B[RUCE], Department of Poultry Husbandry, Cornell University, Ithaca, New York..... 1932
L HUYLER, COULTER D[UNHAM], Dewees Island via Charleston, South Carolina..... 1928
HL INGERSOLL, ALBERT MILLS, 908 "F" St., San Diego, California..... 1885
INGLE, MRS. GERTRUDE [MUSSELL], Miller Pl., Long Island, New York.. 1950
INGLES, LLOYD GLENN, Fresno State College, Fresno, California..... 1947
INGRAHAM, EDWARD A[NDREWS], 164 Montague St., Brooklyn, New York 1930
IJAMS, H[ENRY] P[EARLE], R. R. No. 9, Knoxville, Tennessee..... 1922
IMHOF, THOMAS A[NTHONY], Medical Division, Army Chemical Center, Maryland..... 1947
IRVING, J[AMES] GORDON, 631 Albin St., Teaneck, New Jersey..... 1943
IRVING, MRS. WILLIAM GARY, Van Houten Fields, West Nyack, New York 1947
HL ISHAM, CHARLES B[RADLEY], 50 W. 67th St., New York, New York..... 1891
ISHAM, HENRY W[ARE], 460 Bellefontaine St., Pasadena 2, California.... 1949
ISLER, MORTON L., 107 Magnolia Ave., Mt. Vernon, New York..... 1949
IVOR, H[ANCE] ROY, R. R. No. 1, Cooksville, Ontario, Canada..... 1947
JACKSON, C[ICERO] F[LOYD], University of New Hampshire, Durham, New Hampshire..... 1936
HL JACKSON, HARTLEY H[ARRARD] T[HOMPSON], Room 61, United States National Museum, Washington, D. C..... 1910
JACOBS, E. BRYAN, Waynesburg, Pennsylvania..... 1940

JACOBSON, DR. MALCOLM ARTHUR, 13 W. 36 St., New York 19, New York 1947
JAEGER, EDMUND C[ARROLL], Riverside College, Riverside, California.... 1947
JAHN, FRANCES FLOED [MRS. THEODORE], 10241 Chrysanthemum Lane, Los Angeles 24, California..... 1947
JAMES, DOUGLAS A[RTHUR], Vivarium Bldg., University of Illinois, Champaign, Illinois..... 1946
JAMESON, EVERETT WILLIAMS, JR., Division of Zoology, University of California, Davis, California..... 1940
JAMESON, JULIA [JONES], 2107 Hallwood Dr., Memphis 7, Tennessee..... 1949
JANSSEN, ROBERT B., 5128 Indianola Ave., Minneapolis 10, Minnesota.. 1949
JANVRIN, DR. E[DMUND] R[ANDOLPH] P[EASLEE], 38 E. 85th St., New York, New York..... 1919
M JAQUES, F[RANCIS] L[EE], 610 W. 116th St., New York, New York..(1924) 1934
JAQUES, DR. H[ARRY] E[DWIN], 709 N. Main St., Mt. Pleasant, Iowa..... 1948
JAQUES, SAMUEL RANDOLPH, 1122 Nottingham Dr., Shirley Hills, Macon, Georgia..... 1947
JAQUITH, BARBARA E[LIZABETH] [MRS. L. EVERETT], 72 Hudson Dr., Toronto, Ontario, Canada..... 1940
JEFFRESS, ROBERT M[ILLER], 1800 Monument Ave., Richmond 20, Virginia..... 1949
JENKINS, JAMES H[OBART], School of Forestry, University of Georgia, Athens, Georgia..... 1941
JENKINS, LLOYD [SMITH], Davis Hill Rd., Paxton, Massachusetts..... 1932
JENKINS, DR. W[ILLIAM] J[ONES], Box 7, Olanta, South Carolina..... 1949
JENKS, RANDOLPH, 2146 E. 4th St., Tucson, Arizona..... 1928
JENNER, WILLIAM A[LEXANDER], 806 W. Davis St., Fayette, Missouri.... 1932
JENNINGS, WILLIAM S[ELDEN], Box 134, Harlingen, Texas..... 1949
JENSEN, G[RANT] HORTIN, Box 603, Brigham City, Utah..... 1948
JENSEN, MRS. OVE F., Maple City, Michigan..... 1947
L JETER, HORACE HEARNE, 4534 Fairfield Ave., Shreveport 55, Louisiana.. 1946
F JEWETT, STANLEY G[ORDON], 1404 S. E. Bidwell St., Portland 2, Oregon (1906) 1940
JOHN, FRANK THOMAS, 912 Taylor St., State College, Pennsylvania..... 1950
JOHNSON, DR. ALDIS A., 532 1st Ave., Council Bluffs, Iowa..... 1947
JOHNSON, ALFRED WILLIAM, Casilla 327, Santiago, Chile..... 1950
L JOHNSON, CHARLES ALFRED, c/o Colorado Museum, Denver, Colorado.... 1927
JOHNSON, DONALD T[HEODORE], 2336 W. 108 Pl., Chicago 43, Illinois.... 1948
JOHNSON, H[AROLD] A., 212 Edna St., Poland, Ohio..... 1949
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JOHNSON, HARRIS E[LMER], R. R. No. 1, Warren, Pennsylvania..... 1949
JOHNSON, MRS. HERBERT R[AY], 137 Engle St., Tenafly, New Jersey..... 1950
JOHNSON, H[UGH] P[HILIP] H[EWITT], Knutsford, Oak End Way, West Byfleet, Surrey, England..... 1950
L JOHNSON, DR. MURRAY L[EATHERS], 3810 N. 35th St., Tacoma 7, Washington..... 1935
JOHNSON, NED KEITH, 624 Lake St., Reno, Nevada..... 1951
JOHNSON, PERRY F[RANK], 670 Bell Ave., Elyria, Ohio..... 1937
JOHNSON, RAYMOND EDGAR, Lands and Surveys Department, Red House, Port of Spain, Trinidad, British West Indies..... 1945
M JOHNSON, R[OBERT] A[NTHONY], 98 East St., Oneonta, New York..(1930) 1946
JOHNSON, RODNEY K[NOX], 419 Pine St., Friend, Nebraska..... 1948

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JOHNSON, WILLIAM P., 5 Normandy Rd., Asheville, North Carolina..... 1950
JOHNSTON, DAVID WARE, Department of Zoology, University of California, Berkeley 4, California..... 1947
JOHNSTON, IRMA K., Box 206, Huntington, New York..... 1949
JOHNSTON, MARSHALL C[ONRING], 1118 E. Polk St., Harlingen, Texas.... 1949
JOLLIE, T. MALCOLM, Department of Biological Sciences, University of Idaho, Moscow, Idaho..... 1947
JONES, ALEXANDER, 40–45 Hampton St., Elmhurst, New York..... 1949
JONES, F[RED] M[INSON], Cologne, Virginia..... 1931
JONES, DR. GORDON W[ILLIS], Ellwood Farms, Parker, Virginia..... 1933
JONES, HAROLD CHARLES, Box 61, East Carolina Teachers College, Greenville, North Carolina..... 1946
JONES, HAROLD ROBERT, 315 New York St., Scranton 9, Pennsylvania... 1935
JONES, JOHN C[OURTS], Wildlife Research Center, 5810 Namakagan Rd., Washington 16, D. C..... 1930
JONES, JOHN PAUL, 2715—50th St., Des Moines 10, Iowa..... 1948
JONES, S[OLOMON] PAUL, 509 West Ave., N., Waukesha, Wisconsin..... 1920
JONES, W[ALTER] B[RYAN], Geological Survey, P. O. Drawer O, University, Alabama..... 1949
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JOPSON, HARRY G[ORGAS] M[ICHENER], Bridgewater College, Bridgewater, Virginia..... 1949
JORAE, MISS IRENE F[RANCES], Central Michigan College of Education, Mt. Pleasant, Michigan..... 1947
JOSLIN, CHARLES H[ANKS], Box 1046, Port Orchard, Washington..... 1949
JOYNER, J[OHN] W[ILLIAM] E[DWIN], 1504 Lindy Ave., Rocky Mount, North Carolina..... 1947
JUDD, ROBERT S., 75 Old Farm Rd., New Haven, Connecticut..... 1948
JUNG, CLARENCE S[CHRAM], 6383 North Port Washington Rd., Milwaukee 9, Wisconsin..... 1921
JURICA, EDMUND, St. Procopius College, Lisle, Illinois..... 1946
KAAS, WILLIAM M[AXIMILIAN], 35 Old Eagle Rock Ave., Roseland, New Jersey..... 1948
KAERNE, WM. H[AROLD], 127 Ruby St., Winnipeg, Manitoba, Canada.... 1949
KAIMAN, BERNARD D[AVID], 3544–A N. 26th St., Milwaukee 6, Wisconsin 1950
F KALMBACH, E[DWIN] R[ICHARD], 2654 Forest St., Denver, Colorado (1910) 1927
KAMPF, ROY C., 555 Ruth St., Bridgeport, Connecticut..... 1948
KANE, HENRY B[UGBEE], Lincoln, Massachusetts..... 1950
KARRAKER, DAVID O[RVILLE], 1137 W. Market St., Lewisburg, Pennsylvania..... 1950
KASE, JOHN C[HARLES], 501 Chestnut St., Mifflinburg, Pennsylvania.... 1949
KASPAR, JOHN L[OREN], 392—23rd St., Oshkosh, Wisconsin..... 1948
KASSOY, IRVING, 627 Benlen Ave., Columbus, Ohio..... 1950
KATES, HOWARD A[VIL] W[ORRELL], R. R. No. 2, Montoursville, Pennsylvania..... 1948
KAYSER, MISS PAULINE FRIEDA, 2910 Glenwood Rd., Brooklyn 10, New York..... 1942
KEARNEY, M[ATTHEW] J[OSEPH], 812 Lafayette Ave., Morrisville, Pennsylvania..... 1950

KEATING, DR. F[RANCIS] RAYMOND, JR., 620 10th Ave. S. W., Rochester, Minnesota 1941
HL KEAYS, JAMES EDWARD, 328 St. George St., London, Ontario, Canada 1899
KEBLESS, PETER, 162 Van Winkle Ave., Garfield, New Jersey 1950
KEELY, JOSIAH, Box 383, Huntington, Long Island, New York 1947
KEETON, LUTHER F., 26 N. Belvedere Blvd., Memphis, Tennessee 1945
KEITH, MRS. WILLIAM, S. Hamilton Post Office, Topsfield, Massachusetts. 1948
KELLAM, LAWRENCE M[ANNING], J. A. Section, Hdq. 9th Inf. Div., Fort Dix, New Jersey 1947
KELLER, CHARLES E[DWARD], 637 Eastern Ave., Indianapolis 1, Indiana 1949
KELLER, RICHARD T[HOMAS], 717 S. 16th St., St. Joseph 36, Missouri 1947
M KELLOGG, [PETER] PAUL, 115 Dearborn Pl., Ithaca, New York ....(1929) 1939
KELLOGG, JULIET RICHARDSON [MRS. WATERS]. 19 Oneida St., Rye, New York 1937
LM KELLY, JUNEA W[ANGEMAN] [MRS. GEORGE EARLE], 1311 Grand St., Alameda, California .....(1929) 1949
KELLY, VIRGIL [FRANKLIN], JR., 212 Highland Ave., Fayetteville, North Carolina 1949
KELSALL, JOHN P., Dominion Wildlife Service, National Parks Bureau, Ottawa, Ontario, Canada 1947
KELSO, LEON [HUGH], 1370 Taylor, N. W., Washington, D. C. 1929
KEMNITZER, ALLEN E[DWARD], 969 Five Mile Line Rd., Webster, New York 1949
KEMSIES, EMERSON, 102 Farragut Rd., Greenhills 18, Ohio 1949
KENAGA, MR. CLARE BURTEN, 521 Chapin St., Cadillac, Michigan 1951
KENAGA, EUGENE E., 1629 Isabella Rd., R. R. No. 5, Midland, Michigan 1949
KENDALL, HENRY C[OCHRAN], 9 Wickersham Lane, St. Louis 5, Missouri 1949
LF KENDEIGH, S[AMUEL] CHARLES, Vivarium Bldg., University of Illinois, Champaign, Illinois .....(1923) 1943
KENNEDY, GLADE B[EST], 1260 Pennsylvania St., Denver 3, Colorado 1949
KENT, LAWRENCE C., 1896 Cowden Ave., Memphis 4, Tennessee 1946
KENT, WYATT AUSTIN, 815 S. Irolo St., Los Angeles 5, California 1943
KENYON, JAMES A[NTHONY], 417 3rd Ave., Lewiston, Idaho 1946
KENYON, KARL WALTON, 2725 Montlake Blvd., Seattle 2, Washington ... 1944
KERSTING, CECIL C[ARL], 3722 E. Apple Ave., R. R. No. 6, Muskegon, Michigan 1949
KESSEL, BRINA, Fernow Hall, Cornell University, Ithaca, New York 1948
KESTING, THEODORE, Sports Afield, 500 Midland Bank Bldg., Minneapolis 1, Minnesota 1949
KEY, MRS. J. FRANK, Buena Vista, Virginia 1946
KIERAN, JOHN, 4506 Riverdale Ave., New York 63, New York 1947
KILDOW, T[HOMAS MONROE], Box 520, Tiffin, Ohio 1942
HL KILGORE, WILLIAM, 3400 List Pl., Minneapolis, Minnesota 1906
KILLIP, THOMAS, III, 139 Edgeview Lane, Rochester 10, New York 1946
KILLPACK, MERLIN L[EO], Roosevelt High School, Roosevelt, Utah 1949
KIMBALL, DR. HEATHCOTE, 86 4th St., Garden City, Long Island, New York 1947
KIMBALL, THOMAS L[LOYD], 2129 W. Jefferson St., Phoenix, Arizona 1949
KING, DALE S[TUART], Southwest Monuments Association, Box 1728, Santa Fe, New Mexico 1948
KINGERY, HUGH E[PPICH], 2350 Colorado Blvd., Denver 7, Colorado 1949

KINGSBURY, DR. MARGUERITE, Sunmount, New York..... 1950
KINSEY, ERIC CAMPBELL, 155 Bothin Rd., Box 76, Manor, Marin County, California..... 1936
KINSLEY, C[HARLES] H[ARWOOD], Room 1, Agriculture Bldg., Embarcadero at Mission St., San Francisco 5, California..... 1949
L KIRKHAM, STANTON D[AVIS], 152 Howell St., Canandaigua, New York... 1910
KIRKPATRICK, DR. J[OYCE] T[AYLOR], 224½ Main St., Slater, Missouri... 1948
KIRKPATRICK, T[HOMAS] D[EFOREST], Children's Farm Home, R. R. No. 1, Corvallis, Oregon..... 1950
KIRSHER, WILLIAM K., Box 346, Sacramento 2, California..... 1950
KLABUNDE, WALTER, Creek Rd. Ext., R. R. No. 1, Lewiston, New York.. 1949
KLEIN, RICHARD P[AUL], Jackson Rd., R. R. No. 4, Chagrin Falls, Ohio.. 1947
KLEPFER, WARD, 237 Irving Terrace, Kenmore 23, New York..... 1940
KLIMSTRA, WILLARD D[AVID], Zoology Department, Southern Illinois University, Carbondale, Illinois..... 1947
KLONICK, ALLAN S., 828 Grosvenor Rd., Rochester 18, New York..... 1949
KNAPP, W[ILFRID] A[RTHUR], 363 Blythwood Rd., Toronto 12, Ontario.. 1950
KNICKMEYER, ROBERT R., 4453 Russell Blvd., St. Louis 10, Missouri.... 1946
KNIGHT, HOWARD, Weber College, Ogden, Utah..... 1949
KNOHR, DANIEL L[OUIS], 519 Emerald St., Harrisburg, Pennsylvania.... 1949
KNORR, OWEN A[LBERT], 811 N. Cascade, Colorado Springs, Colorado... 1949
KNOWLES, MRS. CARL A., Mapleton, Oregon..... 1950
KNOX, MRS. DOUGLAS [ALMA MILLER VAIL], Sound Shore, Orient, Long Island, New York 1949
KNOX, MISS MARGARET R[ICHARDSON], 4030 Park Ave., Indianapolis 5, Indiana..... 1941
KOCH, PETER, Big Bend Park, Marathon, Texas..... 1940
KOFORD, CARL B., Museum of Vertebrate Zoology, Berkeley 4, California 1942
KOLB, C[HARLES] HAVEN, 5021 Midwood Ave., Baltimore 12, Maryland.. 1937
KORTHEUR, H[ERMANN] FRANCIS, R. R. No. 2, Falls Village, Connecticut. 1950
LM KORTRIGHT, FRANCIS HERBERT, 633 Eastern Ave., Toronto, Ontario, Canada.....(1942) 1945
KOSMOPOULOS, LESLIE WALKER, 2024 Garden St., Santa Barbara, California..... 1948
KOSSACK, CHARLES W[ALTER], 715 S. Division St., Barrington, Illinois... 1946
KOSTER, LOUIS J., East Greenbush, Rensselaer County, New York..... 1949
KOZICKY, EDWARD LOUIS, Wildlife Research Unit, Department of Zoology and Entomology, Iowa State College, Ames, Iowa..... 1947
KRAMER, QUINTIN, 872 Ledger Bldg., Philadelphia 6, Pennsylvania..... 1946
KRAUS, DOUGLAS L[AWRENCE], Rhode Island State College, Kingston, Rhode Island..... 1940
KRAVITZ, ERNEST M., Union St., Matawan, New Jersey..... 1950
KREHBIEL, A[DOLF] J[ACOB], 221 Jefferson St., Clayton, New Mexico.... 1949
KRUG, HOWARD H[ENRY], Chesley, Ontario, Canada..... 1932
KRUMM, KENNETH, Lacreek National Wildlife Refuge, Martin, South Dakota..... 1948
M KUBICHEK, WESLEY FRANK, Fish and Wildlife Service, Department of the Interior, Washington 25, D. C.....(1919) 1939
KUCH, ILSE KIND [MRS. HERMAN F., JR.], 1002 Crest Rd., Philadelphia 31, Pennsylvania..... 1948
KUEHNLE, PAUL, R. R. No. 3, Bucyrus, Ohio..... 1947

KUNKLE, DONALD [EDWARD], 29 Edgewood Rd., Bloomfield, New Jersey. 1950
KUSCHKE, ARTHUR WYNDHAM, JR., 181 N. Franklin St., Wilkes-Barre, Pennsylvania ... 1935
KUTZ, H[ARRY] L[EON], Biology Department, Norwich University, Northfield, Vermont ... 1938
KYLLINGSTAD, HENRY C[ARREL], 1491 Santa Cruz Dr., Santa Fe, New Mexico ... 1947
LABELLE, GEORGE A., Cocagne, New Brunswick, Canada ... 1939
LABRIE, WILLIE, Kamouraska-Moulin, Quebec, Canada ... 1949
LAFLEUR, EDW[ARD] H., 1349 Pentwood Rd., Baltimore 12, Maryland ... 1948
LAING, CHARLES CORBETT, 762 N. Van Buren St., Milwaukee 2, Wisconsin 1948
M LAING, HAMILTON MACK, Comox Post Office, British Columbia, Canada (1917) 1941
LAKE, GEORGE D., Audreys, Burghfield Common, Reading, England ... 1941
LAMB, CHESTER C., Escobedo 69, Irapuato Guanajuato, Mexico ... 1943
LAMB, ROBERT EDWARD, 417 Jackson St., Sterling, Colorado ... 1947
LAMBERT, DR. ADRIAN V. S., 242 E. 72nd St., New York, New York ... 1930
LAMBERT, ROBERT JOHN, JR., 2802 Kenmore Ave., Dayton 10, Ohio ... 1946
LAMM, DONALD W., American Consulate General, Box 783, Lourenco Marques, Mozambique, Africa ... 1941
LAMPE, M[ONTGOMERY] L[EWIS], Roseville Rd., R. R. No. 3, Lancaster, Pennsylvania ... 1949
LANCASTER, DOUGLAS A[LAN], 1437 8th St. S., Fargo, North Dakota ... 1949
LANCASTER, H[AROLD] L[ESLIE], R. R. No. 1, Rodney, Ontario, Canada ... 1948
LANCELEY, W. H., 23 Elmdale Ave., Ottawa, Ontario, Canada ... 1926
LANG, EDWARD B., Mt. Pleasant, Box 351, Newtown, Connecticut ... 1943
LANGELIER, MRS. GUS[TAVE] [ADOLPHE], 95 de l'Entente Boulevard, Quebec, Canada ... 1940
LANGSTROTH, JAMES H[EIDEL], Box 1130, Silver City, New Mexico ... 1924
LANNING, ROBERT GEORGE, 257 Coleman St., Belleville, Ontario, Canada. 1942
LANYON, WESLEY E., No. 5 Happy Acres Trailer Park, Madison, Wisconsin 1947
LAPHAM, VIRGIL TEXAS, c/o B. M. Landry, 420 Arlington Dr., New Orleans 20, Louisiana ... 1946
LARKIN, HARRY HUBBARD, 189 Van Rensselaer St., Buffalo 10, New York. 1949
LARRABEE, AUSTIN P[ARK], Medina, Washington ... 1918
LARRISON, EARL, JR., Department of Biological Science, University of Idaho, Moscow, Idaho ... 1946
M LASKEY, MRS. F[REDERICK] C[HARLES], [AMELIA RUDOLPH], 1521 Graybar Lane, Nashville, Tennessee ... (1933) 1946
LASKY, WILLIAM R., 551 26th St., Santa Monica, California ... 1949
LATHAM, ROY, Orient, Long Island, New York ... 1916
LATTA, KATHARINE, 430 W. Moreland Ave., Philadelphia 18, Pennsylvania 1949
LATTA, WILLIAM C[ARL], Box 481, Wilson Post Office, Norman, Oklahoma. 1948
LATVEN, DR. K. CHARLES, 3224 N. Abingdon St., Arlington, Virginia ... 1946
LAUB, JOSEPH H[ENRY], Neffs, Pennsylvania ... 1950
LAVAL, JOAN [ELIZABETH], 6317–14th Ave. N. E., Seattle 5, Washington. . 1949
LAWRENCE, A[LEXANDER] G[EORGE], City Health Department, Winnipeg, Manitoba, Canada ... 1920
LAWRENCE, MRS. LOUISE DE KIRILINE, Rutherglen, Ontario, Canada ... 1946
LAWRENCE, MRS. WM. G. [MARGARET K.], Moon Ridge, Edgecomb, Maine 1950

LAWRIE, ANDREW HAMPTON, Department of Zoology, University of Toronto, Toronto, Ontario, Canada 1947
LAWSON, PIERRE CHESTER, 720½ N. Washington St., Stillwater, Oklahoma 1951
LAWSON, RALPH, 88 Washington Square East, Salem, Massachusetts 1917
LEA, DR. ROBERT B[ASHFORD], 24 N. Worth Ave., Elgin, Illinois 1941
LEACH, AGNES [MRS. HENRY G.], 1021 Park Ave., New York 28, New York 1949
L LEARING, GEO[RGE] RICHMOND, 168 Beacon St., Boston, Massachusetts .. 1924
LEAVITT, BENJAMIN B[URTON], Department of Biology, University of Florida, Gainsville, Florida 1947
LEAYCRAFT, MRS. EDGAR C. [HELEN B.], Hills Point Rd., Westport, Connecticut 1950
LEE, FORREST BYRON, 1515 Hythe St., St. Paul, Minnesota 1948
LEE, GEORGE R[EYNOLDS], 336 N. Valencia Dr., Albuquerque, New Mexico 1949
LEE, [WILLIAM] DONALD, 431 Greenmount Blvd., Dayton 9, Ohio 1949
LEE, MISS ZELL C[HARLOTTA], 1423 Douglas, Sioux City 18, Iowa 1947
LEEDY, DANIEL L[ONEY], Fish and Wildlife Service, Department of Interior Bldg., Room 2254, Washington 25, D. C. 1937
LEFEVRE, RUFUS H[ARRY], 228 W. Broad St., Tamaqua, Pennsylvania .. 1927
LEGG, MRS. DOROTHY C[OGAN], 1823 Irving Ave. S., Minneapolis 5, Minnesota 1950
LEGG, WILLIAM C[LARENCE], Mt. Lookout, West Virginia 1940
LEHMAN, JOHN R[OBERT], 21 Wilson Dr., Pittsburgh 21, Pennsylvania ... 1949
LEHNERT, ELOISE R[OHMANN], Blairstown, New Jersey 1950
LEIST, MRS. VELISTA P[RESSON], 5102 Capitol Ave., Omaha 3, Nebraska .. 1948
LEISTER, CLAUDE W[ILLARD], Pocono Wild Animal Farm, R. R. No. 1, Stroudsburg, Pennsylvania 1916
LEMIEUX, LOUIS, Apt. 46, 144 Grande Allee, Quebec, Quebec, Canada ... 1949
LEMMON, ROBERT S[TELL], Olmstead Hill, Wilton, Connecticut 1950
LENGEMANN, MARTHA A., 360 Cedar St., Imlay City, Michigan 1949
LENNA, PHILIP R[EGINALD], 603 Lakeview Ave., Jamestown, New York .. 1949
LENZ, HAROLD H[ENRY], Suite 703, 184 W. Washington St., Chicago 2, Illinois 1950
M LEOPOLD, A[LDO] STARKER, Museum of Vertebrate Zoology, Berkeley 4, California ..... (1940) 1946
LEUPOLD, NORBERT H., 3555 S. E. Insley, Portland 2, Oregon 1946
LEVINE, MRS. ELIZABETH E., 10302 Keswick Ave., Los Angeles 64, California 1951
LEVITON, ALAN E., Natural History Museum, Stanford University, California 1946
LEWIS, C. BERNARD, Science Museum, Institute of Jamaica, Kingston, Jamaica, British West Indies 1947
LF LEWIS, HARRISON F[LINT], National Parks Bureau, Department of Mines and Resources, Ottawa, Ontario, Canada ..... (1912) 1942
LIDICKER, WILLIAM [ZANDER], JR., 116–17 Union Turnpike, Forest Hills, Long Island, New York 1950
LIEBE, HAROLD J[OHN], 500 Prospect Ave., Hartford 5, Connecticut 1943
LIEFTINCK, JOHN E[DMUND], 1826 W. Market St., Akron 13, Ohio 1949
M LIGON, J[AMES] STOKLEY, Box 950, Carlsbad, New Mexico ..... (1912) 1927

LILLY, MRS. A. W. [ELSIE P.], 6530 Kenwood Ave., Chicago 37, Illinois.. 1950
LIMES, ERNEST O., JR., 1902 Minnesota Ave., Columbus, Ohio..... 1943
LF LINCOLN, FREDERICK C[HARLES], Fish and Wildlife Service, Department of the Interior, Washington 25, D. C.....(1910) 1934
F LINSDALE, JEAN M[YRON], Jamesburg Route, Robles del Rio, California (1922) 1945
LINTON, M[ORRIS] ALBERT, 315 E. Oak Ave., Moorestown, New Jersey... 1928
LINZ, ARTHUR WILLIAM, 468 Stevens Ave., Ridgewood, New Jersey..... 1950
LIPP, FRANK, R. R. No. 5, Hendersonville, North Carolina..... 1948
LIPTOW, JOSEPH G[ERARD], 527 Elm St., Wyandotte, Michigan..... 1949
LITTLE, MISS MARIAN WHITE, 200 N. Jackson St., Media, Pennsylvania..1936
LIVERMORE, JOHN WALTON, Apt. 11B, 135 E. 54th St., New York 22, New York..... 1947
LIVESAY, [ELIZABETH] ANN, 712 S. MacArthur Blvd., Springfield, Illinois. 1949
LLOYD, CLARK K[ORNER], 11 N. Elm St., Oxford, Ohio..... 1949
LF LLOYD, HOYES, 582 Mariposa Ave., Rockcliffe Park, Ottawa, Ontario, Canada.....(1916) 1932
LLOYD, MRS. WILMOT [HOYES], 582 Mariposa Ave., Rockcliffe Park, Ottawa, Ontario, Canada..... 1925
LOCKWOOD, DR. ROBERT MINTURN, Veterans Administration Hospital, McKinney, Texas..... 1947
LOETSCHER, FREDERICK WM., JR., 507 W. 3rd St., Danville, Kentucky... 1938
LONG, BETTY HOLMES [MRS. HARRY], Green Brier Rd., Westport, Connecticut..... 1949
LONGENECKER, PHIL W[ALTER], Hagerman Hall, Colorado College, Colorado Springs, Colorado..... 1949
LONGFIELD, MRS. CARL [TESSIE CHANDON], Sunrise Highway and Irish Lane, East Islip, Long Island, New York..... 1949
LONGHURST, WILLIAM, Box 464, Sonora, California..... 1941
LONGLEY, WILLIAM H[OWARD], Box 362, Kasson, Minnesota..... 1943
M LONGSTREET, ROBERT JAMES, Box 65C, R. R. No. 2, DeLand, Florida (1923) 1949
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LORD, DR. FREDERIC P[OMEROY], 39 College St., Hanover, New Hampshire 1922
LORING, GEORGE G[ARDNER], 569 Hale St., Prides Crossing, Massachusetts..... 1949
LOUKASHKIN, A. S., 1210 23rd Ave., San Francisco, California..... 1941
LOVELL, DR. HARVEY B[ULFINCH], 3011 Meade Ave., Louisville 4, Kentucky..... 1943
LM LOW, SETH H[ASKELL], R. R. No. 2, Gaithersburg, Maryland.....(1930) 1949
LOWE, WILLIAM JOSEPH, 205 2nd St., Bismark, North Dakota..... 1947
F LOWERY, GEORGE HINES, JR., Louisiana State University, University, Louisiana.....(1934) 1949
L LOWNES, ALBERT E., Box 1531, Providence, Rhode Island..... 1924
LUDWIG, CHARLES, Crawford County Institute, Saegerstown, Pennsylvania 1949
LUDWIG, CLAUD C[ECIL], 279 Durand St., East Lansing, Michigan..... 1947
LUDWIG, DR. F[REDERICK] E[DWIN], 2864 Military St., Port Huron, Michigan..... 1949
LUKENS, WILLIAM WEAVER, JR., Upper Gulph Rd., Radnor, Pennsylvania..... 1946

LUNK, WILLIAM A., 2849 Whitewood, Pittsfield Village, Ann Arbor, Michigan 1938
LUNN, WILLIAM HERBERT, Hillier, Ontario, Canada 1948
LUPIENT, MRS. MARY LOUISE, 212 S. E. Bedford St., Minneapolis, Minnesota 1946
LUSCHER, ROBERT EMILE, 1365 W. 57th Ave., Vancouver, British Columbia, Canada 1947
LUTHY, FERD[INAND], JR., 306 N. Institute St., Peoria, Illinois 1937
LYNCH, MISS AUDRIELLE L., 306 N. Main St., Athens, Pennsylvania 1943
LYON, ALLAN M[ATTHEW], Port Hardy, British Columbia, Canada 1937
LYON, BLAINE M., R. R. No. 1, S., Pocatello, Idaho 1949
LYONS, MRS. ROBERT C., 25 Woodland St., Huntington, Long Island, New York 1949
MAAS, JOHN C[ALVIN], 2056 Eastern Parkway, Louisville 4, Kentucky ... 1949
MACBRIAR, WALLACE N., JR., 624—10th St., St. Cloud, Minnesota 1937
MACCRACKEN, MRS. HELEN DOLMAN, Box 1204, Estes Park, Colorado .. 1931
MACK, H. G., c/o Gilson Manufacturing Company, Guelph, Ontario, Canada 1933
MACKAY, R[ONALD] H[UGH], Department of Zoology, University of British Columbia, Vancouver, British Columbia, Canada 1950
MACKENZIE, DR. LOCKE L., 829 Park Ave., New York 21, New York 1946
MACKWORTH-PRAED, C[YRIL] W[INTHROP], Castletop, Burley, near Ringwood, Hants., England 1928
MACLAY, MARK W[ALTON], 20 Exchange Pl., New York, New York 1905
MACLEAN, DOROTHY W[ILLIAMS], 112 E. Ave., Norwalk, Connecticut 1931
MACLEOD, CHARLES FRANKLYN, Department of Zoology, University of British Columbia, Vancouver, British Columbia, Canada 1949
MACLULICH, DR. DUNCAN A[LEXANDER], 15 Bellwood Ave., Ottawa, Ontario, Canada 1931
MACMULLAN, R[ALPH] A[USTIN], Houghton Lake Wildlife Experiment Station, The Heights, Michigan 1938
MACQUARRIE, ALICE M[AY], Box 606-M, Pasadena 19, California 1949
MADEIRA, JOHN J[AY] P[IERPONT], 39 James St., Morristown, New Jersey. 1950
MADTES, GEORGE R[UMMEL], 622 Glenwood Ave., Youngstown 2, Ohio .. 1949
MAGNER, J[OHN] MARSHALL, 516 Bacon Ave., Webster Groves 19, Missouri 1948
MAGNEY, GERTRUDE BLACKWELL [MRS. G. R.], 5329 Washburn Ave. S., Minneapolis 10, Minnesota 1950
MAIN, MRS. ANGIE KUMLIEN, Fort Atkinson, Wisconsin 1948
MAJOR, JAMES [CALDER], 984 Forrest Rd., N. E., Atlanta 6, Georgia 1949
MALLETTE, ROBERT D., 3973 Violet St., La Mesa, California 1947
MALOOLEY, VULA STARN, R. R. No. 1, Rosedale, Indiana 1947
MANNERS, EDWARD R[OBERT], 216 New Broadway, Brooklawn, New Jersey 1941
M MANNING, THOMAS H[ENRY], 37 Linden Terrace, Ottawa, Ontario, Canada ..... (1937) 1949
MANNIX, MRS. LUCILLE, Apt. E2, 11424 Cedar Rd., Cleveland, Ohio 1947
MANSFIELD, MRS. LLOYD [LOUISE MINER], 44 Wingate Ave., Buffalo 16, New York 1949
MARBLE, RICHARD M[ERRILL], Woodstock, Vermont 1907
MARGOLIN, A[BRAHAM] S[TANLEY], Biology Department, Phoenix College, Phoenix, Arizona 1949

MARIEN, DANIEL, 1916 Grand Concourse, New York 57, New York..... 1947
MARIONNEAUX, ALICE S[TUNTZ] [MRS. BELFORT V.], Ingenio Ofélina, Aguadulce, Panamá..... 1941
MARKS, JACK L[ORAN], Box 780, R. R. No. 5, Portland 1, Oregon..... 1949
MARSH, THOMPSON G., 199 Ash St., Denver 7, Colorado..... 1941
MARSHALL, DAVID B., Box 415, Fallon, Nevada..... 1942
M MARSHALL, JOE T., JR., Department of Zoology, University of Arizona, Tucson, Arizona.....(1941) 1948
MARSHALL, RAYMOND O[SCAR], R. R. No. 2, Columbiana, Ohio..... 1944
MARSHALL, TERRELL, 372 Skyline Dr., Park Hill, North Little Rock, Arkansas..... 1944
M MARSHALL, WILLIAM HAMPTON, Division of Economic Zoology, University Farm, St. Paul 1, Minnesota.....(1935) 1950
MARTIN, NORMAN DUNCAN, 110 York Mills Rd., York Mills, Ontario, Canada..... 1947
MARTIN, PATRICK WALDYVE, 4653 W. 8th Ave., Vancouver, British Columbia, Canada..... 1948
MARTIN, PAUL, Box 532, West Chester, Pennsylvania..... 1945
MASKIEWICZ, JOHN STANLEY, 50 Oak St., Waterbury 4, Connecticut..... 1951
MASLOWSKI, KARL H[ERBERT], 1034 Maycliff Pl., Cincinnati, Ohio..... 1935
MASON, C[HARLES] N[ATHAN], 6432—31st St., N. W., Washington 15, D. C. 1948
M MASON, C[HARLES] RUSSELL, 1376 Walnut St., Newton Highlands, Massachusetts.....(1936) 1947
MASON, EDWIN A., Arcadia Wildlife Sanctuary, Easthampton, Massachusetts..... 1943
MASON, ROBERT F[RENCH], JR., Box 334, Maitland, Florida..... 1929
MASSOTH, CORRINE F[RANCES], Kerhonkson, New York..... 1949
MATHER, GILBERT, 226 Walnut St., Philadelphia, Pennsylvania..... 1944
MATHER, RICHARD H[ENRY], 5583 Queen Mary Rd., Hampstead 29, Montreal, Quebec, Canada..... 1947
MATHEWS, DR. FRANK P[ELLETREAU], Memorial Clinic, Olympia, Washington..... 1923
MATHISON, JANET, 401 Oakwood St., New Kensington, Pennsylvania... 1949
MATTHEWS, WILLIAM HENRY, JR., Apt. 2F, 2 Berkeley Ave., Yonkers 5, New York..... 1948
MATTOCKS, JAMES [RICHARDSON], Professional Bldg., High Point, North Carolina..... 1949
MAY, FRANKLIN H[INSDELL], 201 Baltimore Ave., Takoma Park 2, Maryland..... 1937
M MAY, DR. JOHN B[ICHARD], 325 S. Main St., Cohasset, Massachusetts (1916) 1930
MAYER, CHARLES C[USHING] B[AILEY], R. R. No. 1, Colrain, Massachusetts..... 1949
MAYFIELD, GEORGE R[ADFORD], Calhoun Hall, Vanderbilt Campus, Nashville, Tennessee..... 1917
M MAYFIELD, HAROLD FORD, 2557 Portsmouth St., Toledo 13, Ohio..(1940) 1950
MAYHEW, WILBUR WALDO, 944 Stannage Ave., Albany, California..... 1947
MAYNARD, DONALD MORE, 110 Prospect St., West Newton, Massachusetts 1947
MAYNARD, DR. HERBERT E[RNEST], 464 Commonwealth Ave., Boston, Massachusetts..... 1921

LF MAYR, ERNST, American Museum of Natural History, Central Park West at 79th St., New York 24, New York.....(1929) 1937
MAZZEO, ROSARIO, 120 Elm St., North Cambridge 40, Massachusetts.... 1943
McARTHUR, H[AROLD] E[DWARD], 723 County St., Waukegan, Illinois... 1948
FE McATEE, WALDO LEE, 3 Davie Circle, Chapel Hill, North Carolina (1903) 1913
McBEE, [MRS.] LENA G., 1532 Upson Ave., El Paso, Texas..... 1949
McCABE, ROBERT A[LBERT], 424 University Farm Pl., Madison 5, Wisconsin..... 1946
McCAMEY, B[ENJAMIN] FRANK[LIN] [JR.], Box U-87, Storrs, Connecticut.. 1947
McCART, WM. L[ARREY], 1309 Saint Louis Ave., Fort Worth 4, Texas.... 1950
McCARTY, ORIN P., South Mountain Rd., Pittsfield, Massachusetts..... 1946
McCLUNG, ROBERT M[ARSHALL], New York Zoological Park, New York 60, New York..... 1949
McCLURE, H[OWE] ELLIOTT, 406 Med. Gen. Lab., APO 500, San Francisco, California..... 1942
McCONNELL, HARRY [BURNS], 142 E. Warren St., Cadiz, Ohio..... 1947
HL McCOOK, PHILIP JAMES, 25 E. End Ave., New York 22, New York..... 1895
McCORMICK-GOODHART, L[EANDER], "Bellapais," Box 186, R. R. No. 1, Alexandria, Virginia..... 1927
McCUE, EARL N[EWLON], Box 104, Morgantown, West Virginia..... 1949
McCULLAGH, DR. E[RNEST] PERRY, Cleveland Clinic, 2020 E. 93rd St., Cleveland, Ohio..... 1934
McCULLOCH, N[ORMAN] B[OWMAN], JR., 2013 Glenwood Ave., Raleigh, North Carolina..... 1950
McDOUGALL, MISS LUCIE F[RANCES], Centre Rd., Port Credit, Ontario, Canada..... 1947
McDOWELL, SAMUEL BOOKER, 328 Gardner Ave., Trenton 8, New Jersey 1947
McELROY, THOMAS P[ARKER], JR., Pequot-sepos Wildlife Sanctuary, Pequot-sepos Ave., Mystic, Connecticut..... 1947
McENTEE, ELINOR G. [MRS. HOWARD G.], 490 Fairfield Ave., Ridgewood, New Jersey..... 1949
McGAW, MRS. G. H[AMPTON] [ELIZABETH T[AYLOR]], 18 Beech St., Woodsville, New Hampshire..... 1949
McGEEN, DR. DANIEL S., 28 Shaw St., West Roxbury, Massachusetts... 1945
McILVAINE, JOHN F[OLWELL], 141 E. Maple Ave., Langhorne, Pennsylvania..... 1949
McILWAINE, WILLIAM B[AIRD], JR., "Sysonby," R. R. No. 4, Petersburg, Virginia..... 1933
McILWRAITH, T[HOMAS] F[ORSYTH], 30 Strathallan Blvd., Toronto 12, Ontario, Canada..... 1933
McINTOSH, WILLIAM B[AXTER], 414 Oakridge Blvd., Lynchburg, Virginia 1940
McINTYRE, JAMES D[OUGLASS], 403 Castlefield Ave., Toronto 12, Ontario, Canada..... 1950
McIVER, SAMUEL H[ODGDEN], 6326 Knox Ave. S., Minneapolis 19, Minnesota..... 1950
McKAY, ARLIE K[YLE], Box 252, R. R. No. 2, Baytown, Texas..... 1946
McKAY, REG[INALD] R., Apt. 18, 1310 Willowbranch, Jacksonville 5, Florida..... 1949
McKEEVER, STURGIS, Spring Creek, West Virginia..... 1949
McKINLEY, DANIEL LAWSON, State Poultry Station, Mountain Grove, Missouri..... 1951

McKINNEY, ROBERT G[ERHARD], 86 Hurstbourne Rd., Rochester 9, New York 1950
McKINNEY, MRS. W[ALTER] A. [CORRA-MAYE], 2932 S. Woodward Blvd., Tulsa 5, Oklahoma 1949
McKITTRICK, THOMAS HARRINGTON, JR., 520 E. 86th St., New York, New York 1928
McKNIGHT, EDWIN T[HOR], 5038 Park Pl., Washington 16, D. C. 1947
McLAUGHLIN, FRANK WINNIFRED, Apt. B, 923 White Horse Pike, Oaklyn, New Jersey 1947
McLAUGHLIN, VINCENT P., JR., 2057 Mathews Rd., Youngstown, Ohio .. 1938
McLEAN, DONALD D[UDLEY], 2455 Cottle Ave., San Jose 25, California .. 1930
McLEOD, JOHN A[LLEN], JR., 113 E. Hendrix St., Greensboro, North Carolina 1950
McMANUS, REID, JR., Memramcook, New Brunswick, Canada 1930
McMILLAN, EBEN, Cholame, California 1947
McMILLAN, IAN I[RVING], Box 63, Shandon, California 1947
McMILLAN, JOHN F[RANK], Department of Biology, College of St. Thomas, St. Paul 1, Minnesota 1949
McMILLAN, W[ILLIAM] G[ARRETT], Box 1447, Lubbock, Texas 1949
McMILLAN, WILLIAM R[ENTON], 12701 12th Ave., N. W., Seattle 77, Washington 1938
McNICHOLS, E. HUGH, 534 Federal Way, Boise, Idaho 1949
McPHERSON, ARNOLD, 1117 Ave. B. N., Saskatoon, Saskatchewan, Canada 1948
McQUEEN, LAWRENCE [BLAIR], 212 S. 4th St., Mifflinburg, Pennsylvania 1950
MEACHAM, FRANK B., North Carolina State Museum, Raleigh, North Carolina 1947
MEADE, DR. GORDON M[ONTGOMERY], Trudeau Sanatorium, Trudeau, New York 1936
MEANLEY, M. BROOKE, 4710 Keswick Rd., Baltimore, Maryland 1935
MEANS, AMOS I[SAIAH], 140 S. 17th Ave., Maywood, Illinois 1950
L MEDCALF, ROBERT, Apt. 102, 1431 S. W. Park Ave., Portland, Oregon 1943
MEDEIROS, JOSEPH S., R. R. No. 1, Waiakoa, Maui, Hawaii 1950
MEDFORD, HUGH L[OVE], JR., 830 Cornwallis Rd., Greensboro, North Carolina 1949
MEHNER, JOHN F[REDERICK], 1003 James St., Pittsburgh 34, Pennsylvania 1948
MELLINGER, ENOS OREN, Chincoteague Wildlife Refuge, Box 62, Chincoteague, Virginia 1940
MENABONI, ATHOS, 1111 Cook Rd., R. R. No. 10, Atlanta, Georgia 1947
MENABONI, MRS. SARA, 1111 Cook Rd., R. R. No. 10, Atlanta, Georgia .. 1947
M MENDALL, HOWARD L[EWIS], 28 Pendleton St., South Brewer, Maine (1934) 1946
MENEFEE, EMORY, State Teachers College, Livingston, Alabama 1950
L MENG, HEINZ, 116 Miller St., Ithaca, New York 1944
MENGEL, ROBERT M[ORROW], 20 E. Shore Dr., Whitmore Lake, Michigan 1938
MEREDITH, REX, 121 Monckton Ave., Quebec, Canada 1927
MERITT, JAMES K[IRKLAND], 99 Battle Rd., Princeton, New Jersey 1942
MERKEL, TERRENCE J[OSEPH], 2050 Fell St., San Francisco 17, California 1950
MEROVKA, LAWRENCE J[OSEPH], 533 N. Solano St., Albuquerque, New Mexico 1948

MERRILL, MISS ANNE, 81 Beachview Crescent, Toronto 13, Ontario, Canada 1946
MESSNER, CLARENCE J[OHN], 308 McKinley Rd., Grosse Pointe 30, Michigan 1949
METCALF, HOMER N[OBLE], Department of Horticulture, Montana State College, Bozeman, Montana 1946
MEWALDT, LEONARD RICHARD, Department of Zoology, Washington State College, Pullman, Washington 1947
MEYER, DR. HENRY, 307 Spaulding Ave., Ripon, Wisconsin 1944
L MEYER, MISS HELOISE, Lenox, Massachusetts 1913
MEYERRIECKS, ANDREW J[OSEPH], Box 4251, University of Tennessee Post Office, Knoxville, Tennessee 1948
MICHENER, JOSEPHINE R. [MRS. HAROLD], 418 N. Hudson Ave., Pasadena 4, California 1950
MICKEY, ARTHUR B[AYARD], 1516 Rainbow Ave., Laramie, Wyoming 1936
MIDDLETON, R[AYMOND] J[ONES], 131 N. Whitehall Rd., Norristown, Pennsylvania 1920
MIDDLETON, W[ILLIAM] R[OBERT], 106 N. Lincoln Ave., Wenonah, New Jersey 1948
MIGDALSKI, EDWARD C., Peabody Museum of Natural History, Yale University, New Haven, Connecticut 1946
MILBY, T[ORBERT] H[ICKMAN], JR., 311 N. W. 20th St., Oklahoma City 3, Oklahoma 1948
MILES, M[ERRIAM] L[EE], Chamber of Commerce, Daytona Beach, Florida ... 1941
MILLAR, ISABEL[LA] I[ZATT], 36 Dearbourne Ave., Toronto 6, Ontario, Canada 1950
F MILLER, ALDEN H[OLMES], Museum of Vertebrate Zoology, Berkeley 4, California ..... (1929) 1939
MILLER, MRS. ALICE D., 1150 Brewer Rd., Leonard, Michigan 1949
MILLER, CARL A[NTHONY], JR., 232 Ohio Ave., Louisville, Ohio 1950
MILLER, MRS. CLARENCE H[EATH], 1354 Herschel Ave., Cincinnati 8, Ohio 1939
L MILLER, DOUGLAS S[COTT], 122 Lawrence Ave. E., Toronto, Ontario, Canada 1938
MILLER, MISS H[ELEN] ELIZABETH, Stromsburg, Nebraska 1950
MILLER, GERRIT S[MITH], JR., 2810 Adams Mill Rd., Washington 9, D. C. 1948
MILLER, HERBERT J[OHN], 341 Bailey St., East Lansing, Michigan 1949
MILLER, J[AMES] ROBERT, Emmons Farms, R. R. No. 2, Oneonta, New York 1946
MILLER, JEROME S[TAPLETON], 1338 Washtenaw, Ann Arbor, Michigan .. 1949
MILLER, DR. JOHN R., Pathological and Clinical Laboratory, 1022 Fulton-Fresno Bldg., Fresno 1, California 1946
F MILLER, LOYE H[OLMES], University of California, Los Angeles, California (1918) 1930
MILLER, LYLE DEVERN, 650 Almyra Ave., Youngstown, Ohio 1947
MILLER, RICHARD W[ELLS], 113 W. 8th St., Cambridge, Ohio 1949
M MILLER, ROBERT C[UNNINGHAM], California Academy of Sciences, San Francisco, California ..... (1935) 1942
MILLER, WILLIAM R[OSEWARNE], Fish and Game Service, R. R. No. 1, Milton, Vermont 1949
MILLETTE, ROBERT L[OOMIS], Chandler Rd., R. R. No. 3, Oswego, Oregon 1948

MILLION, ALBERT, 2060 Rustic Rd., Dayton 5, Ohio 1948
MILLS, DUDLEY H[OLBROOK], Glen Head, Long Island, New York 1929
MILLS, ERIC LEONARD, 670 Island Park Dr., Ottawa, Ontario, Canada ... 1951
MILLS, HARLOW B[URGESS], Illinois Natural History Survey, Resources Bldg., Urbana, Illinois 1949
MILLS, DR. H. R., 706 Franklin St., Tampa, Florida 1949
MILLS, MRS. PETER J. [NANCY M.], R. R. No. 2, Chesterton, Indiana 1950
MILNE, GEORGE P[ARKER], 56 Somerset Ave., Pittsfield, Maine 1950
MILNES, MISS HATTIE K[ERNAHAN], 331 Gowen Ave., Mt. Airy, Philadelphia 19, Pennsylvania 1934
MINER, MRS. EDNA WOLF, 2206 Brun, Houston 19, Texas 1950
MINICH, EDWARD C[ONRAD], 1047 Fairview Ave., Youngstown 2, Ohio ... 1949
MINOR, WILLIAM FAULKNER, Bristol Laboratories, Inc., Syracuse 1, New York 1946
MINTURN, WARD B[LACKLER], 2840 Mariposa St., Fresno 1, California ... 1947
MITCHELL, ERNEST E[UGENE], JR., 539 Glenwood Dr., Charlotte 6, North Carolina 1949
MITCHELL, G[EORGE] J[OSEPH], 3282 W. 8th Ave., Vancouver Island, British Columbia, Canada 1949
M MITCHELL, HAROLD D[IES], 378 Crescent Ave., Buffalo, New York. (1930) 1949
MITCHELL, MRS. HELEN W[EBER], Wade Park Manor, Cleveland 6, Ohio. 1948
L MITCHELL, MRS. OSBORNE S. [MARGARET H.], c/o Brazilian Traction, 25 King St. W., Toronto, Ontario, Canada 1928
HL MITCHELL, DR. WALTON I[UNGERICH], 398 Vassar Ave., Berkeley, California 1893
MOHLER, LEVI L[APP], 1000 S. 35th St., Lincoln, Nebraska 1950
MOHR, CHARLES EDWARD, Audubon Nature Center, R. R. No. 4, Greenwich, Connecticut 1942
MOLLENKOPF, MILTON E. L., 750 Mahoning Ave., Warren, Ohio 1950
MONAHAN, DR. E[LMER] P[ERRY], 814 Argyle Bldg., 306 E. 12th St., Kansas City 6, Missouri 1949
MONCRIEFF, J[ESSE] EDWIN, 2745 E. 8th St., National City, California ... 1949
MONK, H[ARRY] C[RAWFORD], 406 Avoca St., Nashville 5, Tennessee 1921
M MONROE, BURT L[EAVELLE], Ridge Rd., Anchorage, Kentucky .... (1935) 1947
MONROE, DR. JAMES, Ray Brook, New York 1940
M MONSON, GALE [WENDELL], Box 1717, Parker, Arizona ..... (1937) 1950
MONTAGUE, A[LLEN] C[OOMBS], 417 South Blvd., Oak Park, Illinois 1949
MONTGOMERY, CARL E[DWIN], 402 S. 4th St., Emmaus, Pennsylvania 1944
MONTGOMERY, GEORGE HUGH, 4689 Westmount Ave., Westmount, Quebec, Canada 1947
MOODEY, GERTRUDE, 603 Watchung Ave., Plainfield, New Jersey 1949
MOODY, A[DELBERT] J[OHN], c/o Aetna Life Insurance Company, Hartford, Connecticut 1918
MOODY, MISS OLIVE B[EAUCHAMP], 510 River Rd., Beaver, Pennsylvania. 1949
MOODY, R[OLLIN] W[AYNE], 612 Harrison St., Denver 6, Colorado 1949
MOON, MISS JENNIE S[ENNETT], 105 W. Woodbine St., Chevy Chase 15, Maryland 1949
MOON, DR. NEIL S[ENNETT], 257 Pemberton Rd., Rochester 9, New York. 1949
MOORE, JAMES R[ICHARDS], Saybrook, Connecticut 1937
MOORE, JOHN J., 133 Blue Hills Parkway, Milton, Massachusetts 1942

Moore, Miss Martha R[utherford], 27 Eastover Park, Louisville 6, Kentucky 1949
Moore, Robert B[yron], 3434 Hollywood Dr., Baton Rouge 5, Louisiana. 1949
LF Moore, Robert Thomas, Meadow Grove Pl., Flintridge, California (1898) 1940
Moore, Tilford, 2265 Carter Ave., St. Paul 8, Minnesota 1945
Moores, Kenneth C., 1455 W. 58th Ave., Vancouver, British Columbia, Canada 1949
Moran, James Vincent, 50 Seaverns Ave., Jamaica Plain 30, Massachusetts 1947
More, R[obert] L[ee], Jr., 1907 W. Wilbarger St., Vernon, Texas 1949
Morejohn, Gonzalo Victor, Box 26, R. R. No. 1, Davis, California 1947
Moreland, Geo[rge] E[dward], Houghton College, Houghton, New York 1949
Moreno, Abelardo, Universidad de la Habana, Habana, Cuba 1942
Morgan, Allen H[ungerford], Cochituate Rd., Wayland, Massachusetts 1947
Morgan, J[ames] C[larence], 177 Keewatin Ave., Toronto 12, Ontario, Canada 1950
L Morgan, John Sage, 38 Garrison Rd., Brookline, Massachusetts 1927
Morgan, Thomas Nolen, R. R. No. 1, West Grove, Pennsylvania 1948
Morin, J[ohn] P[hillip], Oasis Farm, Cadwell Rd., Cabano, Quebec, Canada 1948
Morine, Alfred M[onroe], Hennepin, Illinois 1949
Morioka, H[iroyuki], 614 Kichijoji, Musashino-shi, Tokyo, Japan 1950
Morrison, Alva, 2 Garden Terrace, Cambridge 38, Massachusetts 1946
Morrison, Kenneth Douglas, R. R. No. 2, Mt. Kisco, New York 1947
Morrissey, Thomas J[ustin], 325 McClellan Blvd., Davenport, Iowa ... 1947
Morrow, Mrs. John, Jr. [Dessie P[owers]], 1320 N. State St., Chicago 10, Illinois 1946
Morse, Miss Margarette E[lthea], 122 W. South St., Viroqua, Wisconsin 1919
Morton, Duryea, 135 Park Ave., Greenwich, Connecticut 1947
Morton, Fred C[onstine], Box 949, Savannah, Georgia, ... 1947
Moser, Dr. Howard F[ranklin], 315 Cresswell St., Ridley Park, Pennsylvania 1948
Moser, Jane Myers [Mrs. R. Allyn], R. R. No. 1, Benson Station, Omaha 4, Nebraska 1946
Moser, [Edward] Randolph, Apt. D, 470 E. Washington St., Pasadena 6, California 1947
LM Moser, Dr. R[euben] Allyn, R. R. No. 1, Benson Station, Omaha 4, Nebraska ..... (1940) 1947
Moses, Dr. Leon, 8 E. 75th St., New York 21, New York 1948
Mostoller, Ralph V[ickroy], 1 Cleveland St., Johnstown, Pennsylvania. 1936
Mott, Peter R[hoades], 30 Titus Ave., Lawrenceville, New Jersey 1948
Moulton, Francis S[evern], 14 Acorn St., Boston 8, Massachusetts 1926
Moulton, Francis Severn, Jr., 2 Elm St., Concord, Massachusetts 1947
Mounteer, Elwood S., 540–1 Buhl Bldg., Detroit 26, Michigan 1949
Muchmore, Dr. William B[reuleux], 219 University Park, Rochester 20, New York 1949
L Mudge, Edmund W., Jr., 5926 Averill Way, Dallas 5, Texas 1947
Mueller, Frank D[ouglas], 49 Radford Ave., Toronto, Ontario, Canada. 1950

MUELLER, HELMUTH C[HARLES], 2756 N. Palmer St., Milwaukee 12, Wisconsin 1948
MUELLER, MISS PAULINE V[ERNER], 8 Southmoreland Pl., Decatur, Illinois 1949
MULLER, CARL LURMAN, 40 Wall St., New York 5, New York 1947
MULLIGAN, WALTER F., 9210 49th Ave., Berwyn, Maryland 1947
MUNRO, DAVID AIRD, Department of Zoology, University of British Columbia, Vancouver, British Columbia, Canada 1947
MUNRO, F. W., Royal Canadian Air Force Corporals Club, Camp Borden, Ontario, Canada 1946
M MUNRO, GEORGE C[AMPBELL], 3029 Hibiscus Dr., Honolulu 15, Hawaii (1939) 1945
F MUNRO, JAMES A[LEXANDER], Okanagan Landing, British Columbia, Canada ..... (1913) 1926
MUNTER, W[ILLIAM] H[ENRY], 550 Federal Bldg., Seattle, Washington ... 1927
MURDEN, MISS ETHEL M[ARY], Box 85, Geneva, New York 1947
MURDOCK, JAMES [INGRAM], 311 Irving Pl., Glendale, California 1943
MURDY, H[ORATIO] W[ILLIAMS], Box 418, Webster, South Dakota 1949
M MURIE, O[LAUS] J[OHAN], Moose, Wyoming ..... (1913) 1934
M MURPHEY, DR. EUGENE EDMUND, 432 Telfair St., Augusta, Georgia. (1934) 1940
MURPHY, JAMES J., 5010 Knox St., Philadelphia 44, Pennsylvania 1949
MURPHY, JOSEPH ROBISON, Box 461, Station 1, Provo, Utah 1951
F MURPHY, ROBERT CUSHMAN, American Museum of Natural History, Central Park West at 79th St., New York 24, New York ... (1905) 1920
MURPHY, MRS. ROBERT CUSHMAN [GRACE EMELINE BARSTOW], 49 W. 52nd St., New York, New York 1919
M MURRAY, J[OSEPH] J[AMES], 6 White St., Lexington, Virginia ..... (1928) 1936
MURRAY, J[OHN] LAURENCE, Box 311, Compton, California 1940
MURRAY, LEO T., Box 138, Billings, Montana 1947
MUSGROVE, JACK W[ARREN], 2414 Adams St., Des Moines, Iowa 1946
MUSSELMAN, T[HOMAS] E[DGAR], 124 S. 24th St., Quincy, Illinois 1922
MYERS, EVERETT C[LARK], Bowling Green State University, Bowling Green, Ohio 1949
MYKLEBUST, ROY J[OHN], 1084 E. 7th N., Provo, Utah 1948
NAETHER, CARL, 4442 Woodman Ave., Sherman Oaks, California 1947
NASH, NATHANIEL CUSHING, IV, 1267 Osgood St., North Andover, Massachusetts 1940
NATHAN, BERNARD, 245 Elmwood Ave., Buffalo 9, New York 1946
NAUMBURG, WALTER W[EHLE], 121 E. 64th St., New York 21, New York. 1923
LM NAUMBURG, MRS. WALTER WEHLE, 121 E. 64th St., New York 21, New York ..... (1916) 1924
NEAL, MRS. CHARLES, Box 133, Demorest, Georgia 1947
NECKER, WALTER L., 1338 Diversey Parkway, Chicago 14, Illinois 1947
NEESS, JOHN CARL, Department of Zoology, University of Wisconsin, Madison, Wisconsin 1948
NEFF, JOHNSON A[NDREW], Wildlife Research Laboratory, Bldg. 8, Denver Federal Center, Denver 2, Colorado 1919
NELSON, MRS. CHARLES E[LLSWORTH], JR., 124 Oxford Rd., Waukesha, Wisconsin 1938
NELSON, G[IDEON] E[DMUND], JR., Department of Biology, University of Florida, Gainesville, Florida 1949

NELSON, G[AYLE] H[ERBERT], Department of Biology, Washington Missionary College, Takoma Park, Washington 12, D. C..... 1950
NELSON, MRS. GRACE SHARRITT, National Elk Refuge, Jackson, Wyoming 1949
NELSON, HARRY P[ETER], 838 N. Cass St., Milwaukee 2, Wisconsin..... 1948
NELSON, T[HEO] W[ALLFREID], 432 Jewell St., Topeka, Kansas..... 1949
NELSON, MISS THEODORA, 315 E. 68th St., New York 21, New York.... 1927
NERO, ROBERT W[ILLIAM], Department of Zoology, University of Wisconsin, Madison, Wisconsin..... 1950
NESSLE, JAMES P[HILIP], 1823 Barrows St., Toledo 12, Ohio..... 1949
NETHERTON, HAZEL I. M. [MRS. CLIFFORD L.], Belle View Apt. B-1, 1004 Wakefield Dr., Alexandria, Virginia..... 1947
NEVINS, ROBERT B[ENJAMIN], 630 S. Fillmore, Kirkwood 22, Missouri.... 1949
NEW, JOHN G., R. R. No. 5, Scranton Rd., Hamburg, New York..... 1946
NEWILL, DR. D[OMER] S[LATER], R. R. No. 2, Connellsville, Pennsylvania 1949
NEWMAN, COLEMAN C[ONWAY], Game and Fresh Water Fish Commission, Tallahassee, Florida..... 1949
NEWMAN, ROBERT J[AMES], Zoology Department, Louisiana State University, Baton Rouge, Louisiana..... 1943
LF NICE, MRS. MARGARET MORSE, 5725 Harper Ave., Chicago 37, Illinois (1920) 1937
NICHOL, LLOYD C., R. R. No. 4, Smiths Falls, Ontario, Canada..... 1946
M NICHOLS, CHARLES K[ETCHAM], 212 Hamilton Rd., Ridgewood, New Jersey.....(1931) 1948
NICHOLS, MRS. CHARLES K., 212 Hamilton Rd., Ridgewood, New Jersey 1933
M NICHOLS, JOHN TREADWELL, American Museum of Natural History, Central Park West at 79th St., New York 24, New York...(1901) 1914
NICHOLS, L[EON] NELSON, 331 E. 71st St., New York, New York..... 1917
NICHOLS, WILLIAM WALLACE, Box 918, R. R. No. 3, Vista, California.... 1950
NICHOLSON, DONALD JOHN, 1224 Palmer St., Orlando, Florida..... 1947
NICKELL, WALTER P[RINE], Cranbrook Institute of Science, Bloomfield Hills, Michigan..... 1941
NICKELSBURG, MRS. M. S. [JANET], 2585 Union St., San Francisco 23, California..... 1950
M NIEDRACH, ROBERT J[AMES], Box 116A, R. R. No. 3, Littleton, Colorado. 1944
NIEHAUS, DR. FREDERICK W[ILHELM], 411 S. 40th St., Omaha, Nebraska. 1949
NIELSON, BEATRICE WISE, Box 149, R. R. No. 1, Ridgecrest Ave., Los Gatos, California..... 1949
NIEMI, BENHARD E[UGENE], 1002 6th St., International Falls, Minnesota. 1949
NIPER, GAIL BROUGHTON [MRS. LEONARD C.], 99 Ridgwood Rd., Clifton, New Jersey..... 1949
NIVEN, KENNETH D[UNCAN], 61 Broadway, Monticello, New York..... 1949
NOLAN, THOMAS B[RENNAN], United States Geological Survey, Washington, D. C..... 1935
NORBY, DARWIN E[MIL], Department of Botany, Indiana University, Bloomington, Indiana..... 1950
NOREN, OSCAR B., 17015 Kinloch St., Detroit 19, Michigan..... 1947
NORMAN, JAMES L[EE], Operations Office, Corps of Engineers, Tulsa, Oklahoma..... 1949
NORRIS, ROBERT [ALLEN], Museum of Vertebrate Zoology, Berkeley 4, California..... 1939

Norris, Russell T[aplin], 50 Milk St., Newburyport, Massachusetts... 1938
North, George W[ebster], 249 Charlton Ave. W., Hamilton, Ontario, Canada... 1938
Northrop, Myron, 7934 Delmar Blvd., University City 5, Missouri.... 1949
Northwood, John d'Arcy, 270 N. Fullerton Ave., Montclair, New Jersey. 1946
Norton, Eleanor Hoge, 1502 Perry St., Columbus 1, Ohio..... 1948
Norton, Peter, 115 Alpine Terrace, Oakland 18, California..... 1947
Novaes, Fernando [da] C[osta], Aptd. 303, Rua Toneleiros 186, Copacabana, Rio de Janeiro, Brazil... 1949
Nuss, E[lmer] Maurice, 3617 W. 6th St., Topeka, Kansas..... 1949
Nutt, David C., Dogford Rd., Etna, New Hampshire..... 1938
Nyc, Frederick F[rancis], Box 869, Brownsville, Texas..... 1943
Oakeson, Mrs. Barbara D., University of California, Santa Barbara, California... 1947
LF Oberholser, Harry C[hurch], 2933 Berkshire Rd., Cleveland Heights, Cleveland 18, Ohio.....(1888) 1902
Oberly, Donald B[enjamin], R. R. No. 2, Urbana, Ohio..... 1947
Obusek, Andrew W[illiam], 1611 New York Ave., Portvue, McKeesport, Pennsylvania... 1949
O'Connor, Miss Esther L[aura], 4344 Locust St., Kansas City 4, Missouri... 1944
Odlum, Gordon C[olin], Triple Island Lightstation, Department of Transport, Box 999, Prince Rupert, British Columbia, Canada.... 1948
Odom, Babette Moore [Mrs. Edgar R.], Box 458, Orange, Texas..... 1949
M Odum, Eugene P[leasants], University of Georgia, Athens, Georgia (1932) 1944
Odum, H[oward] Thomas, Department of Biology, University of Florida, Gainesville, Florida... 1941
Oehser, Paul Henry, Smithsonian Institution,, Washington 25, D. C... 1940
Olivier, Georges, 6 Rue Charles Flavigny, Elbeuf [Seine Inferieure], France... 1935
Olmsted, Roger O., 818 Alabama, Lawrence, Kansas..... 1949
Olsen, Dr. Richard E[llsworth], 3325 Franklin Rd., R. R. No. 3, Pontiac, Michigan... 1949
Olson, Leo B[ernie], 835 S. 1st St., Dekalb, Illinois..... 1949
Ommanney, Geoffrey G[ream], Hudson Heights, Quebec, Canada..... 1941
O'Neil, Mrs. Norah Selby, 1311 Bonham St., Commerce, Texas..... 1948
Orbison, Douglas Campbell, Guard Hill Rd., Mt. Kisco, New York... 1947
Oresman, Stephen B[ergel], 115 Central Park West, New York 23, New York... 1948
Orme, Miss Nellie Elizabeth, 522 N. 15th St., Clarinda, Iowa..... 1948
Ormondroyd, Jesse, 2104 Copley Ave., Ann Arbor, Michigan..... 1949
Orr, Miss E[mma] Virginia, N. Valley Rd., Paoli, Pennsylvania..... 1939
Orr, Mary, Reserve, New Mexico..... 1948
M Orr, Robert T[homas], California Academy of Sciences, Golden Gate Park, San Francisco 18, California.....(1937) 1941
Orth, John C., Trailside Museum, Bear Mountain, New York..... 1936
Overton, Miss Marion F[rances], 42-11 Kissena Blvd., Flushing, New York... 1950
Orvis, Mrs. Clay Hardin, 164 E. 72nd St., New York 21, New York... 1949
Overing, Robert, R. R. No. 4, Raleigh, North Carolina..... 1929
L Owen, Miss Juliette Amelia, 603 N. 8th St., St. Joseph 11, Missouri.. 1897

OWEN, OLIVER S[YLVANOUS], Department of Biology, Ripon College, Ripon, Wisconsin 1948
OWRE, OSCAR T[HEODORE], 2625 Newton Ave. S., Minneapolis 8, Minnesota 1934
L PACK, ARTHUR NEWTON, Ghost Ranch, Abiquiu, New Mexico 1929
PACKARD, CHRISTOPHER M., Box 120, R. R. No. 1, Brunswick, Maine ... 1950
PACKARD, FRED M[ALLERY], 181 High St., Passaic, New Jersey 1935
PAFF, DR. WILLIAM A[LFRED], 2601 E. Jackson Blvd., Elkhart, Indiana .. 1927
PAHRMAN, CHARLES F., 1011 4th St., Laporte, Indiana 1949
PAINE, ROBERT T[REAT] III, 2 Hubbard Park, Cambridge, Massachusetts . 1950
PAINTON, DR. HARRY R., 175 Foothill Rd., Santa Barbara, California ... 1949
PALMER, GEORGE A[NTHONY], 37 Revere St., Boston 14, Massachusetts ... 1949
PALMER, HENRIETTA E[LIZA], [MRS. W. J.], 886 Dickerson Ave., Detroit 15, Michigan 1949
M PALMER, RALPH S[IMON], New York State Museum, State Education Bldg., Albany 1, New York ..... (1932) 1947
HL PALMER, SAMUEL COPELAND, Swarthmore College, Swarthmore, Pennsylvania 1899
LF PALMER, THEODORE SHERMAN, 1939 Biltmore St., N. W., Washington, D. C. ..... (1888) 1901
PALMER, MRS. THEODORE SHERMAN [BERTHA ELLIS], 1939 Biltmore St., N. W., Washington, D. C. 1918
PALMQUIST, C[LARENCE] O[SCAR], 7400 N. Odell Ave., Chicago 31, Illinois . 1950
PARK, CHARLES F[REDERICK], JR., Department of Geology, Stanford University, California 1936
PARKER, CLARENCE J[OSEPH], 821 N. Garfield Ave., Alhambra, California . 1947
PARKER, HARRY C[LARENCE], Box 546, Yosemite National Park, Yosemite, California 1927
PARKER, HENRY M[ELVILLE], 84 Garden St., Cambridge, Massachusetts . 1940
PARKER, H[ENRY] R[ELFE], 112 Hickory Dr., Montgomery 7, Alabama ... 1949
PARKES, KENNETH C[ARROLL], Laboratory of Ornithology, Fernow Hall, Cornell University, Ithaca, New York 1947
PARKS, RICHARD A[NTHONY], 2303 Pembrook Pl., N. E., Atlanta, Georgia . 1947
PARMALEE, PAUL WOODBURN, Box 1361, College Station, Texas 1951
PARMELEE, DAVID F[REELAND], Apt. 1326, 1465 University Terrace, Ann Arbor, Michigan 1948
PARSONS, MISS ELIZABETH N[ORCROSS], 1419 Spring St., Parkersburg, West Virginia 1947
PARTIN, J. L., 10650 Rochester Ave., Los Angeles 24, California 1947
PATE, MISS LENNIE ELIZABETH, 1315 E. Cervantes St., Pensacola, Florida 1946
PATRICK, FORREST D[E ESTE], JR., 550 Washington St., Walla Walla, Washington 1949
PATTEN, BERNARD C[LARENCE], JR., 34 Main St., Little Ferry, New Jersey 1950
PATTEN, JOHN A., Department of Biology, New York University, Box 226, University Heights, New York 53, New York 1948
PATTERSON, JOHN E[LLIOT], 29 Forestry Bldg., University of California, Berkeley 4, California 1929
PAUL, LUCIUS H., 51 Riverview Pl., Rochester 8, New York 1908
PAULSEN, MRS. MARY H., R. R. No. 1, Sussex, Wisconsin 1948

PAULSON, C. W. GEOFFREY, Monotype Corporation, Ltd., Salfords, Redhill, Surrey, England 1947
PAUTKE, CAROLYN [HENRIETTA], 5367 Maplewood Ave., Detroit 4, Michigan 1949
PAXTON, THOMAS R[ICE], 745 Wellesley Ave., Akron 3, Ohio 1947
PAYNTER, RAY A[NDREW], JR., 208 Forest Hill Rd., Hamden 14, Connecticut 1946
PEABODY, JAMES [BISHOP], Princeton, Massachusetts 1940
PEARL, LESLIE S[TEWART], 230 E. 50th St., New York 22, New York 1949
PEARSE, THEED, Comox, Vancouver Island, British Columbia, Canada .. 1926
PEARSON, ALLEN M[OBLEY], Box 1031, Auburn, Alabama 1940
PEASLEY, MRS. HAROLD R. [HELENE MARGUERITE], 2001 Nash Dr., Des Moines 14, Iowa 1949
PECK, ARTHUR FRANCIS, 1311 Needham Ave., New York 67, New York .. 1948
PEDERSON, DONALD P[ENHALLEGON], 43 E. Lattimore Rd., Rochester 20, New York 1948
PEELLE, MILES L., 1039 College Ave., Adrian, Michigan 1948
PEES, H. CHESTER, 899 Porter St., Meadville, Pennsylvania 1950
PELL, WALDEN, II, St. Andrew's School, Middletown, Delaware 1938
PELLEW, MISS MARION JAY, The Heights, Aiken, South Carolina 1919
PELOUBET, MRS. SIDNEY W., 228 Sagamore Rd., Maplewood, New Jersey. 1939
M PEMBERTON, JOHN ROY, 714 W. Olympic Blvd., Los Angeles 15, California (1918) 1940
PEPPER, WILLIAM, 20 E. Bells Mill Rd., Philadelphia 18, Pennsylvania .. 1930
PEQUEGNAT, WILLIS E[UGENE], Department of Zoology, Pomona College, Claremont, California 1948
L PERKINS, DR. ANNE ELIZABETH, 16 Sewall Rd., South Berwick, Maine .. 1917
PERKINS, MRS. STANTON A. [MARY L.], 1305 S. 52nd St., Omaha, Nebraska 1941
PERRING, MISS LOUISE F[RANKLIN], 4821 Cedar Ave., Philadelphia 43, Pennsylvania 1949
PERRY, FRANCES, Greene, Rhode Island 1949
PERRY, GEORGE L[EWIS], 15 Everell Rd., Winchester, Massachusetts 1923
PERRY, WILLIAM L[OUIS], 27 Bay St., Newport, Florida 1949
PERRYGO, WATSON M[ONDELL], United States National Museum, Washington 25, D. C. 1949
PERSON, ELMER [G.], 406 Cleveland Ave., Ishpeming, Michigan 1949
M PETERS, HAROLD S[EYMOUR], 968 Cumberland Rd., N. E., Atlanta 6, Georgia ..... (1924) 1947
F PETERS, JAMES LEE, Museum of Comparative Zoology, Cambridge 38, Massachusetts ..... (1904) 1927
PETERS, [SAMUEL] IVAN, 819 E. 1st St., Tucson, Arizona 1949
PETERSON, ALFRED, Box 20, Brandt, South Dakota 1920
PETERSON, LAWRENCE M[INOR], S. Ave. Extension, Bradford, Pennsylvania 1949
PETERSON, LIVEN A[DAM], JR., Box 1381, Billings, Montana 1949
F PETERSON, ROGER TORY, Box 7, Glen Echo, Maryland ..... (1929) 1948
M PETRIDES, GEORGE A[THAN], Department of Fisheries and Wildlife, Michigan State College, East Lansing, Michigan ..... (1941) 1949
PETRISHIN, MRS. MABEL OLIVE, 1465 21st Ave., San Francisco 22, California 1948

LF PETTINGILL, OLIN SEWALL, JR., Department of Zoology, Carleton College, Northfield, Minnesota.....(1930) 1947
PETTIT, LINCOLN C[OLES], Box 217, Hiram, Ohio..... 1949
PETTOCK, ANNE G[RACE], Apt. 2, 539 Hamilton St., Allentown, Pennsylvania..... 1950
PEYTON, SIDNEY B[URNS], Box 260, R. R. No. 2, Fillmore, California.... 1946
PHELPS, FRANK M[ILLS], 312 5th St., Elyria, Ohio..... 1912
PHELPS, JAMES H[ARVEY], JR., 429 E. Carter St., Pocatello, Idaho..... 1933
L PHELPS, MRS. KATHLEEN DEERY, Apartado 2009, Caracas, Venezuela... 1949
M PHELPS, WILLIAM H[ENRY], Apartado 2009, Caracas, Venezuela...(1937) 1944
LM PHELPS, WILLIAM H[ENRY], JR., Apartado 2009, Caracas, Venezuela.(1940) 1948
PHILIPPE, MRS. LIONEL [FERNAND], Institut de Biologie, Université de Montréal, Montreal, Canada..... 1948
PHILLIPI, RODULFO A., Tobalaba 157, Santiago, Chile..... 1941
LM PHILLIPS, ALLAN R[OBERT], 113 Olive Rd., Tucson, Arizona.....(1932) 1946
PHILLIPS, HOMER WAYNE, 1418–A Brackenridge Apts., Austin, Texas... 1948
L PHILLIPS, JOHN MACFARLOWE, 2227 Jane St., Pittsburgh, Pennsylvania.. 1920
PHILLIPS, RICHARD E[DWARD], 415 N. Court St., Crown Point, Indiana.. 1949
PHILLIPS, RICHARD S[TUART], 834 Liberty St., Findlay, Ohio..... 1946
PHILLIPS, WILLIAM B., 155 E. 82nd St., New York 28, New York..... 1950
PICKENS, DR. A[NDREW] L[EE], 2701 Selwyn Ave., Charlotte, North Carolina..... 1949
PICKERING, ROBERT, 66 Menno St., Waterloo, Ontario, Canada..... 1948
M PIERCE, FRED J[OHN], Winthrop, Iowa.....(1948) 1950
L PIERCE, ROBERT ALLEN, Nashua, Iowa..... 1941
M PIRNIE, MILES D[AVID], Conservation Institute, Michigan State College, East Lansing, Michigan.....(1919) 1937
P PITELKA, FRANK A[LOIS], Museum of Vertebrate Zoology, Berkeley 4, California.....(1937) 1948
PITTMAN, JAMES A[LLEN], 421 E. Concord, Orlando, Florida..... 1947
PLAISTED, WALTER WILLIAM, 95 Newcomb Rd., Tenafly, New Jersey.... 1950
PLAPP, DORIS A[NNE], 4140 N. Keeler Ave., Chicago 41, Illinois..... 1949
PLATFORD, SIDNEY D., 4166 5th Ave., Los Angeles 43, California..... 1937
M PLATH, KARL, 305 S. Cuyler Ave., Oak Park, Illinois..... (1925) 1950
PLATT, CHARLES, III, 62 Lexington St., Weston, Massachusetts..... 1950
PLATT, DR. RUTH M[ONTAGUE], 441 Lyceum Ave., Philadelphia 28, Pennsylvania..... 1949
PLATT, WILLIAM, 0–979565, AACOC No. 5, SOC, The Armored School, Fort Knox, Kentucky..... 1949
HL POE, MISS MARGARETTA, Earl Court, St. Paul and Preston Sts., Baltimore, Maryland..... 1899
POMEROY, F[RED] E[LMER], 342 College St., Lewiston, Maine..... 1920
POOLE, CECIL A[VERY], 1764 Topeka Ave., San Jose 28, California..... 1941
M POOLE, DR. EARL L[INCOLN], Public Museum, Reading, Pennsylvania (1916) 1942
POOLE, FRAZER G., 1306 Garden St., Santa Barbara, California..... 1942
LM POOR, HUSTACE HUBBARD, 230 E. 71st St., New York 21, New York.(1934) 1950
POPE, LILLIAN GORZYCKI, Buzon No. 38, R. R. No. 1, Rio Piedras, Puerto Rico..... 1948
PORTER, ELIOT F[URNESS], Box 33, R. R. No. 1, Santa Fe, New Mexico. 1947
PORTER, H[ORACE] PAUL, Box 4009, Honolulu, Hawaii..... 1949

PORTER, RICHARD DEE, 3130 Ogden Ave., Ogden, Utah 1948
PORTER, SYDNEY, The White Gates, 149 Stenson Rd., Derby, England ... 1949
PORTER, T[HOMAS] WAYNE, Department of Zoology, Michigan State College, East Lansing, Michigan 1937
POTTER, BEATRICE B[ROWN], 2111 Malvern Rd., Charlotte 7, North Carolina 1948
POTTER, DAVID M[ORRIS], 1557 Timothy Dwight College, Yale University, New Haven, Connecticut 1946
M POTTER, JULIAN K[ENT], 437 Park Ave., Collingswood, New Jersey. (1912) 1944
POTTER, L[OUIS] HENRY, R. R. No. 1, West Rutland, Vermont 1922
L POTTS, F[RED] A[NDREW], 404 S. Main St., Waupaca, Wisconsin 1922
LM POUGH, RICHARD H[OOPER], American Museum of Natural History, Central Park West at 79th St., New York 24, New York .... (1922) 1947
POYNTER, MARIE [SYLVIA], Apt. F2, Stoneleigh Apartments, 21 S. Stone Ave., LaGrange, Illinois 1949
PRATHER, MILLARD F[ILLMORE], 1129 Brown-Marx Blvd., Birmingham 3, Alabama 1939
PRATT, HERBERT W[ATSON], 160 State St., Boston 9, Massachusetts 1948
PRAY, RUSSELL H[ARVEY], 662 Santa Rosa Ave., Berkeley 7, California ... 1949
F PREBLE, EDWARD A[LEXANDER], 3027 Newark St., N. W., Washington, D. C. ..... (1892) 1935
PRENDERGAST, J[AMES] STAFFORD, Eden Hill, Tyrone, Pennsylvania 1949
PRENTICE, DON S[MITH], 5216 E. Dr., Rockford, Illinois 1947
PRESCOTT, KENNETH WADE, Museum of Zoology, University of Michigan, Ann Arbor, Michigan 1947
PRESCOTT, MRS. S. C., 249 Tappan St., Brookline 46, Massachusetts 1922
PREST, JOHN H[AMILTON], R. R. No. 1, Bear, Delaware 1947
PRESTWICH, ARTHUR A[LFRED], 61 Chase Rd., Oakwood, London N. 14, England 1949
PRICE, CHARLES E[VANS], JR., Woodward Ave., Moylan, Pennsylvania .. 1948
PRICE, HOMER F., Payne, Ohio 1943
PRICE, JAMES C., 277 Laurier Ave., Quebec, Canada 1949
PRIMLEY, WALTER S., c/o American Chicle Company, 405 Lexington Ave., New York 17, New York 1934
PRINGLE, CORNELIA C[OVINGTON], 1816 Vallejo St., San Francisco 23, California 1950
PRIOR, E. GERTRUDE, Sweet Briar, Virginia 1947
PROBST, ROBERT T[HEOBALD], 92 Harkness Dr., Milford, Connecticut 1949
L PROCTER, MRS. LILLIAN S[ANFORD], 610 Park Ave., New York, New York 1928
L PROCTER, WILLIAM, Biological Survey of Mt. Desert, Bar Harbor, Maine 1928
PROCTOR, CHARLES A[LBERT], 23 Rope Ferry Rd., Hanover, New Hampshire 1947
PRUITT, BEN H[ARRISON], Box 33, R. R. No. 2, Springfield, Oregon 1947
PRUITT, MRS. WILLIAM O., JR. [Erna Nauert], 7351 Sharp Ave., St. Louis 16, Missouri 1948
PUESCHEL, PAUL, 520 Drexel Ave., Glencoe, Illinois 1949
PULICH, WARREN M[ARK], c/o Fish and Wildlife Service, Boulder City, Nevada 1949
PURINTON, DORIS M[AY], 61 Grandview Terrace, Hartford 6, Connecticut 1950
PURSELL, WILLIAM MCCLAIN, 511 Neilson St., Berkeley 7, California 1947

PUTMAN, WILLIAM L[LOYD], Dominion Entomological Laboratory, Vineland Station, Ontario, Canada 1937
PUTNAM, LOREN SMITH, Department of Zoology, Ohio State University, Columbus 10, Ohio 1942
PYLE, ROBERT L[AWRENCE], 851 Malcolm Ave., Los Angeles 24, California 1949
QUATTLEBAUM, W[ILLIAM] D[AN], 1925 Paloma St., Pasadena 7, California 1924
QUAY, BILL [WILBUR BROOKS], Rose Cottage Farm, Locustville, Virginia. 1946
QUAY, THOMAS L., Zoology Department, North Carolina State College, Raleigh, North Carolina 1942
QUEENY, EDGAR M[ONSANTO], R. R. No. 13, Kirkwood, Missouri 1950
QUIGLEY, FRANK D[OUGLAS], Edgemont Rd., Maysville, Kentucky 1948
QUINCY, MRS. LYMAN, 9 Frank Clarke St., Sumter, South Carolina 1950
RABB, GEORGE BERNARD, 176 Ashley Ave., Charleston, South Carolina. 1947
RACENIS, JANIS, Universidad Central de Venezuela, Escuela de Ciencias, Departamento de Biologiá, Caracas, Venezuela 1949
M RACEY, KENNETH, 6542 Lime St., Vancouver, British Columbia, Canada (1921) 1950
RADWAY, MERTON, Fish and Wildlife Service, Calais, Maine 1949
RAMSEY, A[LFRED] O[GDEN], McDonogh School, McDonogh, Maryland .. 1949
RAMSEY, RALPH L., 1578 N. Decatur Rd., Atlanta 6, Georgia 1947
F RAND, AUSTIN L[OOMIS], Chicago Natural History Museum, Roosevelt Rd. and Field Dr., Chicago 5, Illinois ..... (1927) 1943
RANDALL, CLARENCE BELDEN, 700 Blackthorn Rd., Winnetka, Illinois ... 1948
RANDALL, ROBERT N[EAL], 117½ 5th St., Bismarck, North Dakota 1939
RANDEL, WILLIAM [PEIRCE], 241 Dixie Dr., Tallahassee, Florida 1949
RANDOLPH, EVAN, Corner of Seminole and Chestnut Aves., Philadelphia 18, Pennsylvania 1949
LM RAPP, WILLIAM FREDERICK, JR., 1219 Ivy St., Crete, Nebraska .... (1939) 1950
RAUSCH, ROBERT [LLOYD], United States Public Health Service, Box 960, Anchorage, Alaska 1949
RAWLINGS, WILLIAM HERBERT, Apt. 1, 341 Graham Blvd., Town of Mount Royal, Montreal 16, Quebec, Canada 1944
L RAYMOND, OLNEY M[ARTIN], 129 Lincoln Pl., Brooklyn, New York 1930
RAYNOR, GILBERT S[IDNEY], Wading River Rd., Manorville, Long Island, New York 1937
READ, BAYARD W[HITNEY], Upper Dogwood Lane, Rye, New York 1949
READ, DUNCAN H., Middleburg, Virginia 1946
L REBMANN, G[ODFREY] RUHLAND, JR., 729 Millbrook Lane, Haverford, Pennsylvania 1948
REDJIVES, C[ASIMIR] F[RANCIS], 881 Washington Ave., Brooklyn 25, New York 1949
REECE, MAYNARD, 6404 S. W. 10th St., Des Moines, Iowa 1948
REED, MRS. ALBERT CLEVELAND [CATHARINE W.], 1519 Morris Ave., Norfolk, Virginia 1942
REED, GUY E., R. R. No. 2, Prairie View, Illinois 1949
REED, PARKER CROSBY, 27 Hayes Ave., Lexington 73, Massachusetts 1948
REEDER, WILLIAM G., 4725 Brynhurst Ave., Los Angeles 43, California .. 1947
REESE, MRS. ROBERT M[ILLER] [REBECCA RAMSEY], 219 S. St. Asaph St., Alexandria, Virginia 1920
REESE, ROBERT W[ILLIAM], 3811 N. Washington Rd., Fort Wayne, Indiana 1949

REGAN, FRANCES M., 113–19 Colfax St., St. Abans 11, New York..... 1948
REGENNAS, CHARLES H[ENRY], JR., 130 W. Lemon St., Lititz, Pennsylvania 1950
REHFISCH, CAROL, 335 Delgado St., Santa Fe., New Mexico..... 1948
HL REHN, JAMES ABRAM G[ARFIELD], Academy of Natural Sciences, Logan Square, Philadelphia, Pennsylvania..... 1901
REICHERT, MRS. R[OBERT] J[ACOB] [ELSA], 14 W. 1st St., Mount Vernon, New York..... 1950
REID, MRS. BRUCE [BESSIE], Box 218, Kountze, Texas..... 1918
REIHER, HILDA, Box 561, R. R. No. 2, North Bend, Oregon..... 1950
REILLY, EDGAR M[ILTON], JR., 305 E. Veterans Pl., Ithaca, New York.... 1947
REINER, JOHN S[TEPHEN], 2220 E. 70th Pl., Chicago 49, Illinois..... 1950
REMENSNYDER, KATHARINE G[OODRICH] [MRS. J. P.], 45 Elm Ave., Metuchen, New Jersey..... 1949
RENEAU, A[RTHUR] C[HARLES], JR., 402 E. Jefferson, Ann Arbor, Michigan 1949
RESSEGUIE, LAURENCE J[OHN], 98 Ramona Ave., Piedmont 11, California 1950
L RETT, EGMONT Z[ACHARY], Santa Barbara Museum of Natural History, Santa Barbara, California..... 1940
REUTHER, RONALD, 1336 Richmond St., El Cerrito, California..... 1947
REYNARD, GEORGE B[ERGIN], 728 Parry Ave., Palmyra, New Jersey..... 1950
REYNOLDS, HAROLD C., Museum of Vertebrate Zoology, Berkeley 4, California..... 1947
REYNOLDS, DR. T. ERIC, 140 Estates Dr., Piedmont 11, California..... 1941
REYNOLDS, WILLIAM P[IUS], 1330 Foulkrod St., Philadelphia 24, Pennsylvania..... 1949
HL RHOADS, CHARLES J[AMES], Bryn Mawr, Pennsylvania..... 1895
L RHOADS, SAMUEL N[ICHOLSON], 81 Haddon Ave., Haddonfield, New Jersey 1885
RHODES, HARRY L., 700 National Bank of Topeka Bldg., Topeka, Kansas 1947
RICE, DALE W[ARREN], 432 W. 42nd St., Indianapolis 8, Indiana..... 1949
RICE, RICHARD D[EAN], 239 Congress Ave., Rochester 11, New York.... 1949
RICE, WARD J[ENNINGS], 5250 N. Pennsylvania St., Indianapolis 20, Indiana..... 1913
RICH, MRS. EVA., 150 W. 80th St., New York 24, New York..... 1946
RICH, F[REDERICK] BEACOM, Box 5113, Daytona Beach, Florida..... 1947
RICHARDS, BOYD S[TEWART], Lot 64, Abney, P. E. Island, Canada..... 1950
RICHARDS, LAWRENCE P[HILLIPS], Museum of Vertebrate Zoology, Berkeley 4, California..... 1950
RICHARDS, TUDOR, Joy's Lane, Groton, Massachusetts..... 1949
RICHARDSON, CARL, Trail, Oregon..... 1946
RICHARDSON, DAVID L[ORD], 1075 Park Ave., New York 28, New York... 1949
RICHARDSON, MRS. ETHEL E., 887 Indian Rock Ave., Berkeley 7, California..... 1947
L RICHARDSON, FLORA S. [MRS. W. D.], 4318 Oakenwald Ave., Chicago 15, Illinois..... 1925
RICHARDSON, FRANK, University of Nevada, Reno, Nevada..... 1939
RICHARDSON, DR. WYMAN, 229 Dudley Rd., Newton Centre, Massachusetts..... 1920
RICHTER, CARL H., 703 Main St., Oconto, Wisconsin..... 1939
RIDGELY, [MR.] BEVERLY S[ELLMAN], 1474 Pawtucket Ave., Rumford, Rhode Island..... 1949
RIGGS, AUSTEN FOX, II, 23 Coolidge Hill Rd., Cambridge 38, Massachusetts..... 1941

RILEY, THOMAS J[AMES], Box 6, Brandywine Station, Schenectady, New York 1949
RINEY, THANE A[LBERT], 18612 Crest Ave., Hayward, California 1946
M RIPLEY, S[IDNEY] DILLON, II, Peabody Museum, Yale University, New Haven, Connecticut ..... (1938) 1942
RITCHEY, DARIUS T[EAGUE], 18—8th St., N. W., Minot, North Dakota .. 1949
RITCHIE, DR. ROBERT C[HARLES], 611 Woburn Ave., Toronto 12, Ontario, Canada 1944
RITLAND, RICHARD M., Department of Biology, Atlantic Union College, South Lancaster, Massachusetts 1949
RITSEMA, LOUISE, 2122 Lakeway Ave., Kalamazoo 28, Michigan 1949
ROBBINS, CHANDLER, JR., Sugar Island Camps, Greenville, Maine 1934
LM ROBBINS, CHANDLER SEYMOUR, Patuxent Research Refuge, Laurel, Maryland ..... (1944) 1949
ROBBINS, MRS. ELEANOR C[OOLEY], [MRS. CHANDLER SEYMOUR], Box 70, Berwyn, Maryland 1939
ROBERT, HENRY C[OOKE], 1683 Johnson Rd., N. E., Atlanta 6, Georgia .. 1949
ROBERTS, ALEXANDER C[RIPPEN], Box 185, R. R. No. 1, Camas, Washington 1949
ROBERTS, BERTRAND, 6951—33rd St., N. W., Washington 15, D. C. 1944
ROBERTS, MRS. FRANCES F., Box B–10, Encinitas, California 1941
ROBERTS, FREDERICK GREER, 71 Hillholme Rd., Toronto, Ontario, Canada 1947
ROBERTS, HAROLD D[AVIS], 610 Harrison St., Black Rivers Falls, Wisconsin 1949
ROBERTS, H[OWARD] RADCLYFFE, Box 493, Bryn Mawr, Pennsylvania ... 1924
ROBERTS, NEDDIE O'MOORE, Box 5194, Station B, New Orleans 15, Louisiana 1948
ROBERTS, OVID E[LI], III, 2607 Finley St., Wheaton Manor, Silver Spring, Maryland 1947
ROBERTS, WILLIAM ELY, 29 W. Stratford Ave., Lansdowne, Pennsylvania 1902
ROBERTSON, HOWARD, 157 S. Wilton Dr., Los Angeles 4, California 1911
M ROBERTSON, JOHN MCB[RIAR], 1677 W. 9th St., Pomona, California (1920) 1948
ROBINS, C[HARLES] RICHARD, 3300 N. 3rd St., Harrisburg, Pennsylvania .. 1948
ROBINSON, ALBERT N[ELSON], JR., Box 7009, University Station, Baton Rouge, Louisiana 1949
ROBINSON, ROBERT W[ILLIAMS], 313 E. Court St., Ithaca, New York 1949
ROCKEFELLER, WILLIAM A[VERY], Room 2610, 52 Wall St., New York 5, New York 1949
RODDIS, RICHARD S. L., 4420 Braeburn Rd., San Diego 4, California 1944
RODOCK, ROY E[DGAR], Northern Idaho College of Education, Lewiston, Idaho 1950
ROESLER, M[AX] STUART, June Rd., Cos Cob, Connecticut 1949
ROESLER, MRS. M[AX] STUART [CAROL S.], June Rd., Cos Cob, Connecticut 1949
LM ROGERS, CHARLES H[ENRY], E. Guyot Hall, Princeton, New Jersey (1904) 1921
L ROGERS, GERALD [TALBOT], Box 2367, 3401 St. Square, Keesler Air Force Base, Mississippi 1941
ROGERS, JOHN MATHER, 17 Phelps St., Binghamton, New York 1938
ROGERS, [MR.] KAY T[ROWBRIDGE], Department of Anatomy, East Medical Bldg., University of Michigan, Ann Arbor, Michigan 1949
ROGERS, [HENRY] THOMAS, Libby, Montana 1947

ROGERS, WALLACE, 715 Ellsworth Dr., N. W., Atlanta, Georgia..... 1921
ROGERS, MRS. WALTER E., Box 385, Appleton, Wisconsin..... 1932
ROGERS, WALTER E., Box 385, Appleton, Wisconsin..... 1935
ROKOSKY, EMIL J[AMES], Racine Zoological Park, 2131 N. Main St., Racine, Wisconsin..... 1949
L ROLLIN, NOBLE, Primrose Cottage, Glanton, Northumberland, England. 1946
ROLLO, MRS. W. E. [MARIE], Otis Rd., Barrington, Illinois..... 1940
ROONEY, JAMES, JR., 1514 S. 12th Ave., Yakima, Washington..... 1943
ROOT, OSCAR M[ITCHELL], Brooks School, North Andover, Massachusetts 1940
ROSA, MRS. MILDRED BAKER, 275 Hillcrest Dr., Encinitas, California.... 1947
ROSE, DR. W[ILLIAM] C[UMMING], 710 W. Florida Ave., Urbana, Illinois.. 1950
ROSEGAY, MARY LOUISE [MRS. HAROLD], R. R. No. 1, Phoenixville, Pennsylvania..... 1946
ROSENBAUM, V. C., 2825 W. 29th Ave., Denver 11, Colorado..... 1946
ROSS, AARON B[ELNAP], 3562 Porter Ave., Ogden, Utah..... 1947
ROSS, C[HARLES] CHANDLER, 7924 Lincoln Dr., Chestnut Hill, Pennsylvania..... 1936
ROSS, MISS EDNA G[RACE], Almonte, Ontario, Canada..... 1948
ROSS, HOLLIS T[REVOR], 29 S. 2nd St., Lewisburg, Pennsylvania..... 1947
ROSS, J[AMES] B[RENT], 225 Oldfield Rd., Decatur, Georgia..... 1949
ROSS, DR. LUCRETIUS H[ENRY], 507 Main St., Bennington, Vermont..... 1912
ROSS, REUBEN J., Box 190, Georgetown, Connecticut..... 1922
ROSS, ROLAND C., 1820 Bushnell Ave., South Pasadena, California..... 1925
ROTH, MISS RUTH M[ARIAN], 412 S. 18th St., Allentown, Pennsylvania.. 1943
F ROWAN, WILLIAM, Department of Zoology, University of Alberta, Edmonton, Alberta, Canada.....(1920) 1950
ROWINSKI, LUDWIG J., 17 Schneider Pl., Passaic, New Jersey..... 1947
ROWLEY, J[OHN] STUART, 403 S. 1st St., Alhambra, California..... 1930
ROYALL, WILLIS C., JR., Apt. 3F, 125 Christopher St., New York 14, New York..... 1945
RUBENDALL, MISS ELIZABETH, Winter Veterans Administration Hospital, Topeka, Kansas..... 1947
RUBEY, WILLIAM W., 16 Westwood Dr., Washington 16, D. C..... 1933
RUDD, DR. CLAYTON GLASS, 315 Medical Arts Bldg., Minneapolis 2, Minnesota..... 1946
RUDD, ROBERT L., Museum of Vertebrate Zoology, Berkeley 4, California 1939
RUDERT, DALE, 5993 Reamy Dr., S. E., Washington 20, D. C..... 1938
RUDOLPH, ROYSTON R[ICE], JR., Mattamuskeet National Wildlife Refuge, New Holland, North Carolina..... 1949
RUEGER, HARRIET STERNE [MRS. CHAS. A.], 2412 Richelieu Ave., S. W., Roanoke 14, Virginia..... 1950
RUFF, MRS. EDWARD S. [MARY E.], 30 Marlborough Ave., Providence, Rhode Island..... 1950
RUHLE, GEORGE C., Crater Lake National Park, Medford, Oregon..... 1946
RUSSELL, DAN M[CALLAN], Box 83, Buffalo, Kentucky..... 1950
RUSSELL, STEPHEN M[IMS], Oakland, R. R. No. 3, Abingdon, Virginia.... 1949
RUSSELL, DR. WHITFIELD LEGGETT, Box 22, Rhome, Texas..... 1941
RUSTAD, ORWIN A., Department of Biology, St. Olaf College, Northfield, Minnesota..... 1950
RUTLEDGE, MARK L[UTHER], c/o Wm. C. Grimm, Pocono Lake, Pennsylvania..... 1949

RUTTER, RUSSELL J[AMES], Box 445, Huntsville, Ontario, Canada..... 1928
RYAN, RICHARD R., 5009 Broadway, New York 34, New York..... 1950
RYCHECK, MARK [RULE], Box 98, Bradfordwoods, Pennsylvania..... 1950
RYDER, RONALD A[RCH], Colorado Cooperative Wildlife Research Unit, Colorado A. and M. College, Fort Collins, Colorado..... 1949
SABIN, WALTON B., 520 Euclid Ave., Syracuse 10, New York..... 1942
SABINE, MRS. WINIFRED S[PRAGUE], 503 Triphammer Rd., Ithaca, New York..... 1950
SACKSTEDER, FREDERICK H., American Embassy, Cairo, Egypt [Mail Room, Department of State, Washington 25, D. C.]..... 1949
SAGE, EVAN V., R. R. No. 3, Waterloo, Iowa..... 1947
SAIT, CARROLL CHARLES, 4134 Old Orchard Ave., Montreal, Quebec, Canada..... 1947
SALLEE, ROY M., Department of Biology, Western Illinois State Teachers College, Macomb, Illinois..... 1931
SALT, GEORGE WILLIAM, Division of Zoology, University of California, Davis, California..... 1947
SAMPSON, EDWARD, Guyot Hall, Princeton, New Jersey..... 1936
SAMPSON, W[ALTER] B[EHNARD], 1005 N. San Joaquin St., Stockton, California..... 1922
SANBORN, ALVAH W., Pleasant Valley Sanctuary, Lenox, Massachusetts. 1946
SANCHEZ-MEJORADA, CARLOS, JR., Chapala Sur 632, Lomas de Chapultepac, Mexico City, Mexico..... 1942
SANDERS, EARL, 1808 Vincent St., Brownwood, Texas..... 1949
SANDERS, KATY FRIEL, Max Meadows, Virginia..... 1949
SATTERLY, JACK, Department of Mines, Parliament Bldgs., Toronto 2, Ontario, Canada..... 1947
SATTERTHWAIT, ELIZABETH ALLEN [MRS. ALFRED FELLENBERG], 806 W. Ohio St., Urbana, Illinois..... 1920
SAUER, DR. GORDON C[HENOWETH], 448 E. 20th St., New York 9, New York..... 1948
SAUGSTAD, N[ELS] STANLEY, R. R. No. 4, Minot, North Dakota..... 1945
F SAUNDERS, ARETAS ANDREWS, 361 Crestwood Rd., Fairfield, Connecticut (1907) 1950
M SAUNDERS, GEORGE B[RADFORD], Federal Center Bldg., 8, Denver 2, Colorado..... (1925) 1947
SAUNDERS, RICHARD M[ERRILL], 9 McMaster Ave., Toronto, Ontario, Canada..... 1935
LM SAVAGE, JAMES, 1053 Ellicott Square, Buffalo, New York..... (1895) 1934
SAVAGE, SAMUEL ROBERT, Box 263, Overton, Texas..... 1947
SAVILE, DR. D[OUGLAS] B[ARTON] O[SBORNE], 6 Oakland Ave., Ottawa, Ontario, Canada..... 1949
SAWYER, DOROTHY M[AY], 323 Division St., Schenectady 4, New York.. 1936
SCARLETT, MRS. VIVIAN B[ULLOCK], 4525 N. Lookout, Little Rock, Arkansas..... 1950
SCATTERGOOD, LESLIE W[AYNE], Fish and Wildlife Service, West Boothbay Harbor, Maine..... 1949
SCHAEFER, OSCAR FREDERICK, 825 Merchants Rd., Rochester, New York. 1916
SCHAFFTER, ALDEN, R. R. No. 3, Wooster, Ohio..... 1950
SCHARFFENBERG, R[ICHARD] S[HIRLEY], 804 Houston Ave., Washington 12, D. C..... 1950

SCHAUGHENCY, C[HARLES] B[ERTRAM], Village Rd., Green Village, New Jersey 1949
SCHEAR, EDWARD WALDO EMERSON, Department of Biology, Otterbein College, Westerville, Ohio 1922
SCHEETZ, MRS. FRANCIS H[ARLEY] [VIRGINIA S.], 15 W. Old Gulph Rd., Ardmore, Pennsylvania 1948
SCHLICK, FRANK, Munnsville, New York 1947
SCHMIDT, EUGENE W[ILLIAM], 494 Church St., New Britain, Connecticut . 1927
SCHMIDT, KARL P[ATTERSON], Chicago Natural History Museum, Chicago 5, Illinois 1950
SCHMIDT, THOMAS B., JR., 3700 Sharon St., Harrisburg, Pennsylvania 1947
SCHNITZER, ALBERT, 922 Lakeside Pl., Elizabeth 3, New Jersey 1945
SCHOB, FRED[ERICK] A[UGUST], 116 E. 1st St., London, Ohio 1949
SCHOLES, ROBERT T[HORNTON], Bushnell, Illinois 1948
LM SCHORGER, A[RLIE] W[ILLIAM], 168 N. Prospect Ave., Madison, Wisconsin (1913) 1940
SCHROEDER, MISS CLARA E., Apt. 104, 12080 Broadstreet, Detroit 4, Michigan 1946
L SCHULTZ, ALBERT B[IGELOW], JR., 1117 Broadway, Hewlett, Long Island, New York 1948
SCHUMM, WILLIAM GEORGE, 302 "C" St., LaPorte, Indiana 1944
SCHUPPEL, W[ILLIAM] C[ARL], 25 Rivo Alto Canal, Long Beach 3, California 1950
SCHWALL, EUGENE EDWARD, Wildlife Resources Commission, Raleigh, North Carolina 1948
SCHWARZ, HERBERT F[ERLANDO], American Museum of Natural History, Central Park West at 79th St., New York 24, New York 1925
SCIPLE, GEORGE W[ASHINGTON], 100 Terrace Dr., N. E., Atlanta 5, Georgia 1949
SCOTLAND, DR. MINNIE B[RINK], 42 Continental Ave., Cohoes, New York . 1936
SCOTT, D[AVID] M[AXWELL], Department of Zoology, University College, University of Western Ontario, London, Ontario, Canada 1950
SCOTT, FREDERIC R[OBERT], 4600 Coventry Rd., Richmond 21, Virginia .. 1943
SCOTT, DR. JOHN W[ILLIAM], 1409 Garfield, Laramie, Wyoming 1934
SCOTT, DR. OLIVER K[ENNARD], 437 E. 13th St., Casper, Wyoming 1936
SCOTT, THOMAS G[EORGE], Illinois Natural History Survey, Natural Resources Bldg., Urbana, Illinois 1938
SCOTT, WALTER E[DWIN], 1721 Hickory Dr., Madison 5, Wisconsin 1937
SCOULAR, MRS. KATE M., 945 Commercial, Superior, Nebraska 1947
SCOVELL, D. E., 170 Indian Grove, Toronto, Ontario, Canada 1943
SCUDDER, WILLIAM F[RANKLIN], R. R. No. 5, Wellsboro, Pennsylvania ... 1949
SEARS, JOSEPH ALDEN, Hillside Rd., Northbrook, Illinois 1934
SEARS, DR. SIGSBY S., 1117 Medical Arts Bldg., Omaha 2, Nebraska 1947
SEDGWICK, JAMES H., 4800 Prospect Rd., Peoria 4, Illinois 1936
SEDWITZ, WALTER WILLIAM, 229 W. 36th St., New York 18, New York ... 1947
SEEBER, EDWARD L[INCOLN], 186 Wabash Ave., Kenmore, New York 1943
SEELY, WARNER, 2171 Middlefield Rd., Cleveland Heights 6, Ohio 1948
SEFTON, J[OSEPH] W[ELLER], JR., c/o Sefton Investment Company, 638 "F" St., San Diego, California 1922
SEHL, ROBERT H., 7027 Hegerman St., Philadelphia, Pennsylvania 1949
SEIBERT, HENRI C[LEVET], Ohio University, Athens, Ohio 1934

SEIBERT, ROBERT F[REDERICK], 151 Garfield Pl., Maplewood, New Jersey. 1949
SEIPLE, STANLEY J., 421 N. Center St., Grove City, Pennsylvania..... 1927
SELBY, GERTRUDE PETTIT [MRS. JAMES A.], Lookout Point, Ridgeville, Ontario, Canada..... 1947
SEMPRUN, RODOLFO J[OSÉ], Callao No. 1460, Buenos Aires, Argentina.... 1950
SENER, RUTH, 233 Charlotte St., Lancaster, Pennsylvania..... 1949
SERBOUSEK, LILLIAN E., 1226 2nd St., S. W., Cedar Rapids, Iowa..... 1947
SERRILL, WILLIAM J[ONES], Haverford, Pennsylvania..... 1916
SETTE, MRS. B[LANCHE] CAROLYN, Box 403-A, R. R. No. 5, New Brunswick, New Jersey..... 1949
SEVERAID, JOYE HAROLD, Museum of Vertebrate Zoology, Berkeley 4, California..... 1947
L SHACKLETON, WALTER H[ODGE], Box 76A, R. R. No. 1, Prospect, Kentucky 1946
SHADLE, ALBERT R[AY], Biology Department, University of Buffalo, Buffalo, New York..... 1928
SHAFFER, CHESTER M[ONROE], Eagle Lake, Florida..... 1940
SHAFTESBURY, ARCHIE D[AVIS], Woman's College, University of North Carolina, Greensboro, North Carolina..... 1937
SHANKS, CHARLES E[LBERT], Wildlife Bldg., Columbia, Missouri..... 1949
SHARP, BARTON L[AMAR], 201 N. Broad St., Lititz, Pennsylvania..... 1931
SHARP, WARD M., Pennsylvania Cooperative Wildlife Research Unit, 206 Forestry Bldg., State College, Pennsylvania..... 1936
SHAUB, BENJAMIN MARTIN, 159 Elm St., Northampton, Massachusetts.. 1947
M SHAVER, JESSE M[ILTON], George Peabody College for Teachers, Nashville, Tennessee.....(1924) 1932
SHAW, DR. CHARLES H[ICKS], 109½ Mulberry St., Bremen, Ohio..... 1947
SHAW, CHARLES R[ICHARD], 1113 Milam St., Pineville, Louisiana..... 1949
L SHAW, HENRY S[OUTHWORTH], Box 294-B, R. R. No. 1, Westbrook, Maine 1916
SHAWEN, DR. CHARLES E., 401 Odlin Dr., Dayton 5, Ohio..... 1949
SHEARER, DR. AMON R[OBERT], Mont Belvieu, Texas..... 1905
L SHEFFLER, WILLIAM J[AMES], 4731 Angeles Vista Blvd., Los Angeles, California..... 1928
SHELDON, ANNE D[UDLEY], 147 Armory St., New Haven 11, Connecticut 1950
SHELDON, WILLIAM G[ULLIVER], Wildlife Department, University of Massachusetts, Amherst, Massachusetts..... 1950
SHELMANDINE, CHARLES G[ARRED], Box 467, Cobleskill, New York..... 1949
SHELTON, LEONARD A[GEE], 313 First National Bldg., Pomona, California 1947
SHELTON, NAPIER, 4411 Hadfield Lane, N. W., Washington 7, D. C..... 1948
SHEPARD, FRANK P[ARSONS], JR., 1035 Park Ave., New York, New York.. 1950
SHEPHARD, JOHN LAURENCE, Box 421, Kaslo, British Columbia, Canada. 1944
SHEPHERD, PRENTISS, JR., 431 Marlboro St., Boston, Massachusetts..... 1946
SHEPPARD, R[OY] W[ATSON], 1805 Mouland Ave., Niagara Falls, Ontario, Canada..... 1928
SHERER, FRANK A., 546 3rd St., Brooklyn, New York..... 1944
SHERMAN, THEODORE, 1029 E. 8th St., Pittsburg, Kansas..... 1950
SHERR, NORMAN A[LLYN], 702 "B" St., Yuba City, California..... 1949
SHOEMAKER, CARL D., National Wildlife Federation, 3308—14th St., N. W., Washington 10, D. C..... 1938
SHORT, WAYNE, 1000—5th Ave., New York 28, New York..... 1943
SHORTT, ANGUS HENRY, 101 Morier Ave., St. Vital, Manitoba, Canada... 1946

M SHORTY, T[ERENCE] M[ICHAEL], Royal Ontario Museum of Zoology, 100 Queen's Park, Toronto 5, Ontario, Canada.....(1931) 1943
SHREVE, BENJAMIN, 29 Chestnut St., Salem, Massachusetts..... 1933
SHUFELDT, ROBERT WILSON, 1918 N. St., N. W., Washington, D. C..... 1946
SHUFFLER, DARREL F[RANKLIN], Box 25, Blue Point, Long Island, New York..... 1949
SHUTTS, J[AMES] HERVEY, 423 Pleasant St., Mankato, Minnesota..... 1950
M SIBLEY, CHARLES G[ALD], Department of Natural Sciences, San Jose State College, San Jose 14, California.....(1939) 1949
SICK, HELMUT, Fundaçao Brasil Central, Avenida Nilo Pecanha 23 III, Rio de Janeiro, Brazil..... 1947
SICK, IRENE E., Cohocton, New York..... 1947
SIEDER, RUSSELL ALAN, 850 Tice Pl., Westfield, New Jersey..... 1946
SIEGER, VERA [ELEANOR], 10058 Aurora, Detroit 4, Michigan..... 1950
SIESS, MISS L[ILLIAN] COLETTE, 129 Poplar Ave., Hackensack, New Jersey..... 1950
L SIMMONS, EDWARD MCILHENNY, Avery Island, Louisiana..... 1941
LM SIMMONS, GEORGE FINLAY, Hull Zoological Laboratory, University of Chicago, Chicago, Illinois.....(1910) 1923
L SIMMONS, GRANT G[ILBERT], JR., Lake Ave., Greenwich, Connecticut.... 1948
SIMMONS, GRANT G[ILBERT], SR., Wiccafold, Greenwich, Connecticut.... 1949
SIMMONS, AMELIA [MRS. WILL[IAM] W.], 2742 N. Maryland, Milwaukee, Wisconsin..... 1946
SIMMS, MISS AURELLA E[THEL], 3916 Euclid Ave., Kansas City 4, Missouri 1949
SIMON, JAMES R[OBERT], Jackson Hole Wildlife Park, Moran, Wyoming.. 1949
SIMON, STEPHEN W[ISTAR], 7727 York Rd., Towson 4, Maryland..... 1948
SIMPSON, MRS. ROXIE COLLIE, 6624—1st St., N. W., Washington 2, D. C. 1946
SIMS, HAROLD LEE, Thibodaux, Louisiana..... 1937
SIMSON, J. N., Nowley, Spring Ridge, New South Wales, Australia..... 1950
SINGH, RAM S[HWAR], Museum of Natural History, Georgetown, British Guiana..... 1946
SINGLETON, ALBERT ROLAND, 3968 Marburg Ave., Cincinnati 9, Ohio.... 1947
SINGMASTER, J[AMES] WALTER, 101 E. Main St., Macungie, Pennsylvania 1949
SIRMON, MRS. GEORGE [ALLIE SLAY], Box 98, Logansport, Louisiana.... 1949
SKELLY, C[HESTER] J., Milton, Wisconsin..... 1950
SKELTON, KATHLEEN GREEN, 353 W. 57th St., New York 19, New York.. 1949
SKILLEN, DONALD R[ALPH], 530 Georgian Rd., Pasadena 3, California.... 1929
LF SKUTCH, ALEXANDER F[RANK], Finca "Los Cusingos," San Isidro del General, Costa Rica.....(1930) 1946
SLACK, MISS MABEL, 1004 Everett Ave., Louisville, Kentucky..... 1937
L SLATER, H. N., Ridgeland, South Carolina..... 1949
SLIPP, JOHN WESLEY, 246 Fisheries Center, University of Washington, Seattle 5, Washington..... 1942
SLOCUM, HARRY S[PENCER], 6358 Bahama Shores Dr., St. Petersburg 5, Florida..... 1928
SMALLEY, ALFRED EVANS, 224 S. Pugh St., State College, Pennsylvania.. 1947
SMART, ROBERT W[ILLIAM], 87 Butterfield Ave., Amherst, Massachusetts 1949
SMILEY, A[LBERT] K[EITH], JR., Mohonk Lake, Ulster Co., New York.... 1928
SMILEY, DANIEL, JR., Mohonk Lake, New York..... 1928
SMITH, ALLEN G[ORDON], Fish and Wildlife Service, Box 603, Brigham City, Utah..... 1948

SMITH, BERTRAM H., 345 Orchard Springs Dr., Dayton 5, Ohio..... 1949
SMITH, CARL E[RNEST], Halsey, Nebraska..... 1947
SMITH, DONALD K[ENNETH], 142 Ferndale Ave., Norwood, Manitoba, Canada..... 1949
SMITH, E[LLA] ESTHER, Box 462, Murphysboro, Illinois..... 1949
SMITH, EARL EMMETT, 10 Agassiz St., Cambridge 40, Massachusetts..... 1947
SMITH, EARL R., Box 541, New Orleans, Louisiana..... 1924
SMITH, MRS. HERMON DUNLAP [ELLEN THORNE], 121 Stone Gate Rd., Lake Forest, Illinois..... 1936
SMITH, MRS. FRANK GLENROY [FRANCES B.], 231½ N. Main St., Jersey Shore, Pennsylvania..... 1949
SMITH, FRANK R[USH], Box 100, R. R. No. 2, Laurel, Maryland..... 1926
SMITH, GEORGE A[RTHUR], 211 E. Avondale Rd., Greensboro, North Carolina..... 1942
SMITH, HARRY M[ADISON], Department of Zoology and Physiology, University of Wyoming, Laramie, Wyoming..... 1938
SMITH, HARRY R[OY], 809 Michigan Ave., Evanston, Illinois..... 1944
HL SMITH, HORACE G[ARDNER], 1327 Sheridan Blvd., Denver 14, Colorado.. 1888
SMITH, IRENE M[ARIE], 1108—26th St., Des Moines 11, Iowa..... 1949
SMITH, J[AMES] DONALD, Board of Agriculture and Forestry, Division of Fish and Game, Honolulu 1, Hawaii..... 1949
SMITH, L[EWIS] MACCUEN, 8040 St. Martins Lane, Chestnut Hill, Philadelphia, Pennsylvania..... 1927
SMITH, LILLIAN AMES, 428 Meridian St., East Boston 7, Massachusetts.. 1944
SMITH, MISS MARION L[UCILLE], 429 S. Willard St., Burlington, Vermont 1950
SMITH, OLIVER LEDIE, R. R. No. 5, Towanda, Pennsylvania..... 1942
SMITH, ORION O., 2911 Spring Creek Rd., Rockford, Illinois..... 1939
SMITH, MRS. OTIS H. [ANNA MARGARET], 107 Alexander Ave., Box 507, Larkspur, California..... 1947
SMITH, ROBERT [JAMES], 401 York St., Olean, New York..... 1950
SMITH, ROBERT L[EO], R. R. No. 1, Reynoldsville, Pennsylvania..... 1944
SMITH, ROBERT SHALAK, 12904 Melgrove Ave., Garfield Heights, Cleveland, Ohio..... 1946
LM SMITH, WENDELL PHILLIPS, Wells River, Vermont.....(1919) 1937
SMITH, W[ILLIAM] JOHN, 45 2nd Ave., Ottawa, Ontario, Canada..... 1949
SMITH, WILLIAM WALTER, 673 Milverton Blvd., Toronto 6, Ontario, Canada..... 1947
SMITHE, FRANK B., 7 Center Dr., Douglaston, Long Island, New York... 1949
SMITHE, F[RANK] NORTON, Apt. 4H, 647 E. 14th St., New York 3, New York..... 1947
SMOOKER, GEORGE D[OUGLAS], c/o Royal Bank of Canada, Port of Spain, Trinidad, British West Indies..... 1926
SMYTH, J[AMES] ADGER, Marine Biological Laboratory, Florida State University, Tallahassee, Florida..... 1933
SMYTH, THOMAS, State Teachers College, Shippensburg, Pennsylvania... 1921
SNAPP, MRS. R[OSCOE] R[AYMOND], 310 W. Michigan Ave., Urbana, Illinois 1947
SNEAD, I. EDWIN, 208 Hanover, Mankato, Minnesota..... 1950
SNODDY, DONALD CALDWALL, 544 Mellen Rd., Knoxville, Tennessee..... 1951
SNYDER, DANA P[AUL], Museum of Zoology, University of Michigan, Ann Arbor, Michigan..... 1947

SNYDER, DOROTHY E[ASTMAN], The Peabody Museum, Salem, Massachusetts 1943
F SNYDER, LESTER L[YNNE], Royal Ontario Museum of Zoology, 100 Queen's Park, Toronto 5, Ontario, Canada ..... (1919) 1947
F SOPER, J[OSEPH] DEWEY, 10520—75th Ave., Edmonton, Alberta, Canada (1918) 1949
L SORRILL, ANNA MARIE [MRS. TOM], R. R. No. 2, Ursa, Illinois 1948
SPANDAU, H[ARRY] M[ICHAEL], R. R. No. 1, Lexington, Ohio 1947
SPAULDING, DR. PERLEY, 360 Prospect St., New Haven 11, Connecticut .. 1950
SPEAR, JOAN L[UCY], 39 W. Elm St., Yarmouth, Maine 1950
SPEIRS, MRS. DORIS HUESTIS, "Cobble Hill," R. R. No. 2, Pickering, Ontario, Canada 1937
SPEIRS, J[OHN] MURRAY, "Cobble Hill," R. R. No. 2, Pickering, Ontario, Canada 1935
SPENCER, DAVID L., Kenai, Alaska 1950
SPENCER, HAVEN H., 4961 Packard Rd., Ypsilanti, Michigan 1947
SPENCER, MISS O[LIVE] RUTH, 1030—125th Ave. Court, Moline, Illinois .. 1941
SPERRY, CHARLES CARLISLE, 1455 S. Franklin St., Denver, Colorado 1920
SPIELMAN, ANDREW, Hagerman Hall, Colorado Springs, Colorado 1951
SPIKER, CHARLES JOLLEY, R. R. No. 1, Branchport, New York 1948
L SPINGARN, EDWARD D[ANIEL] W[OODBURY], 414 Jefferson St., Alexandria, Virginia 1924
SPOFFORD, DR. WALTER R[ICHARDSON] II, Department of Anatomy, State University of New York Medical Center, Syracuse, New York 1927
SPRATT, NELSON T[RACY], University of Minnesota, Minneapolis 14, Minnesota 1947
SPRICK, MARGARET M[ORTON] [MRS. G. B.], 215 Santa Fe Ave., Hamden 14, Connecticut 1949
SPRINGER, PAUL [FREDERICK], Patuxent Research Refuge, Laurel, Maryland 1941
F SPRUNT, ALEXANDER, JR., The Crescent, Charleston 50, South Carolina (1923) 1950
SPRUNT, ALEXANDER, IV, The Crescent, Charleston 50, South Carolina .. 1950
M SQUIRES, W[ILLIAM] AUSTIN, The New Brunswick Museum, Saint John, New Brunswick, Canada ..... (1946) 1950
STABLER, HAROLD B[ROOKE], 6123 Broad Branch Rd., Washington 15, D. C. 1937
STABLER, ROBERT M[ILLER], Colorado College, Colorado Springs, Colorado 1940
STACKPOLE, RICHARD, Wayland, Massachusetts 1937
STAEBLER, ARTHUR E[UGENE], W. E. Kellogg Bird Sanctuary, Hickory Corners, Michigan 1935
STAGER, KENNETH E[ARL], Los Angeles Museum, Exposition Park, Los Angeles, California 1942
STAHL, MARJORETTA J[EAN], Kimberly, West Virginia 1949
STALOFF, CHARLES, 1776 Weeks Ave., Bronx 57, New York 1949
STAMM, ANNE L. [MRS. FREDERICK W.], 2118 Lakeside, Louisville 5, Kentucky 1946
STANLEY, WILLARD F[RANCIS], State Teachers College, Fredonia, New York 1947
STANWELL-FLETCHER, MRS. JOHN F. [THEODORA C[OPE]], Dimock P. O., Pennsylvania 1933

STANWOOD, MISS CORDELIA J[OHNSON], Birdsacre, High St., Ellsworth, Maine 1909
STARK, EARL [VINCENT], 59 Chilton Rd., Toronto, Ontario, Canada 1948
STARR, DR. ROBERT R[USSELL], Howard Clinic, Glasgow, Kentucky 1949
STARRETT, ANDREW, Box 306, Cos Cob, Connecticut 1949
STATON, JACK, "Calidris," Doveridge Ave., Carlton, nr. Nottingham, England 1948
STAUFFER, JAMES M[ILTON], 2554 D Birch St., Eau Claire, Wisconsin ... 1950
STAUFFER, R[ALPH] S[TANLEY], 208 W. Irvin Ave., Hagerstown, Maryland . 1949
STEARNS, EDWIN I[RA], 928 Grant Ave., North Plainfield, New Jersey ... 1945
STEELE, WILLIAM SOLES, 151 Glasgow St., Guelph, Ontario, Canada 1948
STEFFEN, EARNEST WILLIAM, 1000 Maplewood Dr., Cedar Rapids, Iowa .. 1947
STEFFEN, PHILIP N., 2135 Balmoral Ave., Chicago 25, Illinois 1949
STEGEMAN, THELMA I[SIS], 1308 Geddes Ave., Ann Arbor, Michigan 1949
STEIN, ROBERT C[ARRINGTON], 65 Wilton St., New Hyde Park, New York . 1950
STEIRLY, CHARLES C[ORNELL], Virginia Forest Service, Waverly, Virginia . 1947
STEPHENS, JAMES L[INLEY], JR., Box 841, Lumberton, North Carolina ... 1947
STEPHENSON, ROBERT L[LOYD], Box 4066, Austin, Texas 1949
STERN, HERBERT, JR., Apt. D, 1501 General Taylor St., New Orleans, Louisiana 1949
STERNER, DR. LEWIS G[EORGE], Byberry Rd., Somerton, Philadelphia 16, Pennsylvania 1949
STEVENS, C[ECIL] J[OHN], 2 Gordon Terrace, Lamb Park, Par, Cornwall, England 1948
STEVENS, CHARLES E[LMO], JR., 426—2nd St., N. E., Charlottesville, Virginia 1946
L STEVENS, JOHN P., JR., 350—5th Ave., New York 1, New York 1939
STEVENS, O[RIN] A[LVA], State College Station, Fargo, North Dakota 1943
STEVENS, ROBERT DALE, 140 Academy Rd., North Andover, Massachusetts 1943
STEVENS, WARD E[ARL], Department of Zoology, University of British Columbia, Vancouver, Canada 1947
STEVENSON, H. GODWIN, JR., Township Line and Cathcart Rd., Gwynedd Valley, Pennsylvania 1937
STEVENSON, HENRY M[ILLER], Department of Zoology, Florida State University, Tallahassee, Florida 1940
M STEVENSON, JAMES O[SBORNE], Fish and Wildlife Service, Department of the Interior, Washington 25, D. C. ..... (1926) 1948
STEWARD, ORVILLE M[ILTON], Box 19, Fordham Branch, Bronx 58, New York 1950
STEWART, DR. CHARLES A[MERY], R. R. No. 1, New Albin, Iowa 1947
STEWART, MISS MILDRED, 2219 Devonshire Dr., Cleveland 6, Ohio 1946
L STEWART, PAUL A[LVA], 8640 N. State St., Westerville, Ohio 1928
M STEWART, ROBERT E[ARL], Patuxent Research Refuge, Laurel, Maryland (1938) 1949
STEWART, RONALD M., Massett, Queen Charlotte Islands, British Columbia, Canada 1947
STICKNEY, ELEANOR HERRICK [MRS. ALBERT, JR.], R. R., Rockfall, Connecticut 1933
STILES, BRUCE F[LEMING], 601—10th St., West Des Moines, Iowa 1939
STILLWELL, JERRY E., R. R. No. 2, Fayetteville, Arkansas 1934

STIMSON, LOUIS A[LBERT], 1835 Opeedhee Dr., Miami 45, Florida..... 1943
STINE, MISS PERNA M., Box 386, Olney, Illinois..... 1936
STIRLING, DAVID, JR., 153 Chestnut St., Winnipeg, Manitoba, Canada... 1948
STIRRETT, GEO[RGE] M[ILTON], Dominion Wildlife Service, Old Arts Bldg., Queen's University, Kingston, Ontario, Canada..... 1948
STIVERS, ELIZABETH JEANNE, Apt. 202, 3720 Macomb St., N. W., Washington 16, D. C..... 1947
STOCKELBACH, MRS. LAVONIA [RUTH], 25 Gordon Pl., Verona, New Jersey. 1949
STODDARD, E[NOCH] V[INE], Gallup Lane, Waterford, Connecticut..... 1942
LF STODDARD, HERBERT L[EE], Sherwood Plantation, Thomasville, Georgia (1912) 1936
STOKES, ALLEN W., 1014 University Bay Dr., Madison 5, Wisconsin.... 1947
STOLTENBERG, OTTO L., Florence Station, R. R. No. 2, Omaha 12, Nebraska..... 1949
STONE, RUDOLPH H[EGER], 505 Bedford Rd., Schenectady 8, New York.. 1949
STONER, MRS. C. BIRCH, 357 Hobart Ave., Short Hills, New Jersey..... 1944
L STONER, MRS. DAYTON, 399 State St., Albany, New York..... 1946
STONER, EMERSON A[USTIN], Box 444, Benicia, California..... 1922
STOPHLET, JOHN J[ERMAIN], 2612 Maplewood Ave., Toledo, Ohio..... 1937
STORER, JOHN H[UMPHREYS], 579 Beaver St., Waltham, Massachusetts.. 1937
M STORER, ROBERT W[INTHROP], Museum of Zoology, University of Michigan, Ann Arbor, Michigan.....(1935) 1948
M STORER, TRACY I[RWIN], Division of Zoology, University of California, Davis, California.....(1916) 1922
STORRIE, MISS ROBINA, 443 S. Corona St., Denver, Colorado..... 1941
STOTT, KEN[HELM] W[ELBURN], JR., Zoological Society of San Diego, Box 551, San Diego 12, California..... 1944
STOUT, HELEN D., 453 Green Lane, Philadelphia 28, Pennsylvania..... 1949
STOUT, R. GWYNNE, Edge Hill, Glenn Rd., Ardmore, Pennsylvania..... 1940
STRAW, RICHARD M[YRON], 973 W. County Rd., B, St. Paul 8, Minnesota. 1946
STREATOR, CLARK P[ERKINS], 127 Otis St., Santa Cruz, California..... 1939
STREET, PHILLIPS B[ORDEN], 1200 Pennsylvania Bldg., Philadelphia 2, Pennsylvania..... 1946
L STREHLOW, ELMER WILLIAM, 520 E. Montana St., Milwaukee 7, Wisconsin. 1945
STRELITZER, CARL L., 337 N. 29th St., Milwaukee 8, Wisconsin..... 1949
STRIDER, EMMA T[OMLINSON], 1450 Rhode Island Ave., N. W., Washington 5, D. C..... 1949
STRINGHAM, C[HAS.] J[ACOB], Box 280, Minnehaha Country Club, Sioux Falls, South Dakota..... 1950
STRINGHAM, EMERSON, Box 986, Kerrville, Texas..... 1941
STRODE, DON H[ART], Box 105, Frankfort, Kentucky..... 1949
F STRONG, R[EUBEN] M[YRON], 5716 Stoney Island Ave., Chicago 37, Illinois (1889) 1949
STRUTHERS, DANA R[OBERTSON], 4858 Fremont Ave. South, Minneapolis 9, Minnesota..... 1949
STUDHOLME, C[LINTON] R[AYMOND], 16 W. Frederick St., Corry, Pennsylvania..... 1949
M STUPKA, ARTHUR, Great Smoky Mountains National Park, Gatlinburg, Tennessee.....(1934) 1948
STURDEVANT, CARLETON A[USTIN], R. R. No. 1, Prattsburg, New York.. 1949

L STURGEON, MYRON T[HOMAS], Department of Geography and Geology, Ohio University, Athens, Ohio 1938
STURM, LOUIS, S. O. M. Center Rd., R. R. No. 1, Solon, Ohio 1943
SULLIVAN, ARTHUR, 197 Kingsway Ave., Winnipeg, Manitoba, Canada .. 1949
SULLIVAN, CHRISTOPHER H., 5421 Monkland Ave., Montreal 28, Quebec, Canada 1947
M SUMNER, [EUSTACE] LOWELL, 919 Panoramic Way, Berkeley 4, California (1926) 1938
SUMNER, MISS RUTH A[LLERTON], 420 N. 48th St., Omaha 3, Nebraska .. 1949
SUNDELL, ROBERT [ARNOLD], 94 Main St., Frewsburg, New York 1948
SUTHARD, JAMES G[REGORY], 1881 Raymond Ave., Long Beach, California 1923
LF SUTTON, GEORGE MIKSCH, Museum of Zoology, University of Michigan, Ann Arbor, Michigan ..... (1910) 1936
M SWANSON, GUSTAV A[DOLPH], Fernow Hall, Cornell University, Ithaca, New York ..... (1928) 1947
SWEATMAN, G[ORDON] K[ENNETH], 40 Alpine Ave., Hamilton, Ontario, Canada 1950
SWEDENBORG, E[RNIE] D[AVID], 4905 Vincent Ave., South, Minneapolis, Minnesota 1927
SWEET, HERMAN R., Department of Biology, Tufts College, Medford, Massachusetts 1942
SWEET, W[ILLIAM] O[TIS], 175 Park St., Attleboro, Massachusetts 1943
SWENK, JANE B. [MRS. MYRON HARMON], 2435 "A" St., Lincoln 2, Nebraska 1945
SWIFT, ISABEL H[OWLAND], 3 Hackett Circle W., Stamford, Connecticut . 1949
M TABER, WENDELL, 3 Mercer Circle, Cambridge, Massachusetts .... (1933) 1948
TABOR, MISS AVA R[OGERS], 305 Canal Ave., Thibodaux, Louisiana 1937
TAFT, ELIZABETH A., 353 Roosevelt Ave. 10, Syracuse, New York 1940
TAINTOR, ELIZABETH T[ABER], 11 Story St., Cambridge 38, Massachusetts 1949
TALLEY, MRS. LAWRENCE P. [MILDRED P.], 201 Silverside Rd., Wilmington 3, Delaware 1949
TALLMAN, WILLIAM S[WEET], JR., 4 Linden Pl., Sewickley, Pennsylvania .. 1942
TALMADGE, ROBERT R., Box 71, Willow Creek, California 1947
TANCOCK, [MONTAGUE] MONTY A., 425 Crocker Rd., Sacramento 19, California 1950
TANGER, LOUISE F[ORNEY] A[RNOLD], 318 N. President Ave., Lancaster, Pennsylvania 1949
TANGHE, LEO J[OSEPH], 852 Stone Rd., Rochester 16, New York 1949
TANGUAY, ABBE RENE, Ste. Anne's College, Ste. Anne de la Pocatiere, Kamouraska Co., Quebec, Canada 1944
M TANNER, JAMES T[AYLOR], Department of Zoology, University of Tennessee, Knoxville, Tennessee ..... (1933) 1947
TASHIAN, RICHARD E[ARL], 178 Canonchet Ave., Gaspee Plateau 5, Rhode Island 1949
TATE, SALLY [STOUFFER], 3 Thomas Rd., Westport, Connecticut 1950
TAYLOR, HERBERT S[TANTON], 1369 Fair Ave., Columbus 5, Ohio 1948
TAYLOR, DR. ROBERT LINCOLN, 810 Highland Dr., Flintridge, Pasadena 3, California 1947
TAYLOR, LEWIS WALTER, Poultry Division, University of California, Berkeley, California 1925

TAYLOR, LYTTON, St. Paul Pioneer Press, 55 E. Fourth St., St. Paul 1, Minnesota 1949

M TAYLOR, WALTER P[ENN], Oklahoma Cooperative Wildlife Unit, Oklahoma A. and M. College, Stillwater, Oklahoma ..... (1916) 1950

TEACHENOR, DIX, 1020 W. 61st St., Kansas City 2, Missouri 1919

TEALE, EDWIN WAY, 93 Park Ave., Baldwin, Long Island, New York 1947

TEASDALE, ALICE F. [MRS. E. R.], 5636 Drexel Ave., Chicago 37, Illinois. 1950

TEMPLEMAN, WILFRED, Newfoundland Biological Station, Water St. East, St. John's, Newfoundland 1941

TENER, JOHN S[IMPSON], Canadian Wildlife Service, National Parks Branch, Department of Resources and Developments, Ottawa, Ontario, Canada 1949

TERRES, J[OHN] KENNETH, 345 E. 57th St., New York 22, New York 1934

M TERRILL, LEWIS McIVER, 216 Redfern Ave., Westmount, Quebec, Canada (1907) 1947

M TERRY, MARY ELLA McCLELLAN DAVIDSON [MRS. R. A.], 1521 Escobita Ave., Palo Alto, California ..... (1920) 1932

TERRY, DR. ROBERT J[AMES], University Club, St. Louis, Missouri 1919

TEVIS, LLOYD [PACHECO], JR., Box 1416, Carmel, California 1948

THACHER, LOUIS B[ARTLETT], JR., 565 Gay St., Westwood, Massachusetts 1931

THACKER, MAXINE, 110 Kanawha St., Buckhannon, West Virginia 1949

THALLMAN, MRS. GERALDINE COMBS [MRS. ALLIE O.], Bandera, Texas.. 1947

THATCHER, DONALD M[ASON], 2916 Perry St., Denver 12, Colorado 1946

THELEN, HUBERT JOSEPH, 839 Carroll St., Brooklyn 15, New York 1947

M THOMAS, EDWARD S[INCLAIR], Ohio State Museum, Columbus 10, Ohio (1922) 1941

THOMAS, GERALD B[AMBER], 5161 S. Western Ave., Los Angeles 37, California 1949

THOMAS, LANDON B[AILLIE], 1006 Blaine St., Edgerton, Wisconsin 1947

THOMAS, LESTER S[T. JOHN], R. R. No. 2, Newtown, Pennsylvania 1949

M THOMAS, RUTH HARRIS [MRS. ROWLAND], 410 E. Green St., Morrilton, Arkansas ..... (1935) 1950

THOMAS, WILLIAM W[AYT], JR., Old Strowd House, Davie Circle, Chapel Hill, North Carolina 1949

THOMPSON, DANIEL Q[UALE], Wildlife Conservation Bldg., Columbia, Missouri 1949

THOMPSON, DAVID E[DGAR], R. R. No. 1, Leonard, North Dakota 1949

THOMPSON, MARGUERITE LILION [MRS. HERBERT D.], Algonquin Park, Norfolk 5, Virginia 1947

THORLEY, ROBERT F., 3 Midland Gardens, Bronxville 8, New York 1947

THORNBURG, ASHLEY A[LVIN], Box 9, Hot Springs, South Dakota 1950

L THORNE, OAKLEIGH, II, Box 347, Islip, Long Island, New York 1947

THORNTON, WILLIAM JAMES, Box 1011, Birmingham, Alabama 1938

THORNTON, WILMOT A[RNOLD], 124 Washington St., South Norwalk, Connecticut 1949

THORP, GEORGE B[OULTON], 556 Abbott Ave., Ridgefield, New Jersey ... 1935

THORPE, JAMES D[AVID], 9 Elmdale Ave., Akron, Ohio 1942

THORSON, THOMAS B[ERTEL], Department of Zoology, University of Washington, Seattle, Washington 1948

THUENTE, ADELARD W[ALTER], St. John's University, Collegeville, Minnesota 1949

THURSTON, HENRY, Box 214, Montrose, New York..... 1947
TIEMEIER, OTTO W[ILLIAM], Department of Zoology, Kansas State College, Manhattan, Kansas..... 1937
TIFFANY, JOHN SINCLAIR, 136 Seaman Ave., New York 34, New York.... 1948
TILLEY, FRANCIS T[HOMAS], 26 Mohican Ave., Buffalo 8, New York..... 1949
TIPTON, SAMUEL R[IDLEY], 300 W. Adair Dr., Knoxville 18, Tennessee... 1949
TODD, H[ENRY] O[LIVER], JR., 106 E. Main St., Murfreesboro, Tennessee. 1939
F TODD, W[ALTER] E[DMUND] CLYDE, Carnegie Museum, Pittsburgh 13, Pennsylvania.....(1890) 1916
TOMICH, P[ROSPER] QUENTIN, Hastings Reservation, Jamesburg Route, Robles del Rio, California..... 1945
M TOMKINS, IVAN REXFORD, 1231 E. 50th St., Savannah, Georgia...(1928) 1939
TOMPKINS, VICTOR N[ORMAN], 524 Madison Ave., Albany 3, New York.. 1949
TONER, GEORGE CLIVE, c/o Educational Officer, Department of Veterans' Affairs, 55 York St., Toronto, Ontario, Canada..... 1948
TORDOFF, HARRISON B[RUCE], Museum of Natural History, University of Kansas, Lawrence, Kansas..... 1944
TOURING, R[OSCOE] MANVILLE, 275 Woodlawn St., St. James, Manitoba, Canada..... 1947
TOUSEY, MISS KATHARINE, 22 Grand View Ave., Somerville 43, Massachusetts..... 1935
TOUSEY, DR. RICHARD, 6625 Oxon Hill Rd., S. E., Washington, D. C.... 1943
TOUT, WILSON, North Platte, Nebraska..... 1935
TOWE, J[AY] TROY, Box 143, R. R. No. 5, Mt. Airy, North Carolina..... 1949
TOWNSHEND, HENRY HOTCHKISS, 35 Hillhouse Ave., New Haven, Connecticut..... 1915
TRAINER, JOHN E[ZRA], Department of Biology, Muhlenberg College, Allentown, Pennsylvania..... 1937
TRASK, DR. PARKER DAVIES, 240 Southampton Ave., Berkeley 7, California..... 1936
M TRAUTMAN, MILTON B[ERNARD], Stone Laboratory, Put-in-Bay, Ohio (1924) 1940
M TRAYLOR, MELVIN A[LVAH], JR., 759 Burr Ave., Winnetka, Illinois (1940) 1950
TREADWAY, JOHN F[OWLE], Williams Inn, Williamstown, Massachusetts. 1949
TREAT, DOROTHY A[CKLEY], 121 E. 82nd St., New York 28, New York... 1949
TREICHEL, GEORGE W[ILLIAM], JR., 887 Indian Rock, Berkeley, California 1948
TREMBLEY, FRANCIS JOHN, Fire Lane, R. R. No. 3, Bethlehem, Pennsylvania..... 1947
TREVER, MARTHA JOAN, 1655 N. Greenbrier St., Arlington, Virginia.... 1948
TRIMM, H[OWARD] WAYNE, 165 Strong Ave., Syracuse 10, New York.... 1947
TRIVETTE, EDWARD C[ARROLL], Department of Zoology, The State College of Washington, Pullman, Washington..... 1950
TROWERN, ROBERT WILSON, Box 400, New Liskeard, Ontario, Canada.. 1947
TRUSSELL, MALVINA, 2011 Lee Ave., Tallahassee, Florida..... 1949
TRYON, CLARENCE ARCHER, JR., Department of Biological Sciences, University of Pittsburgh, Pittsburgh 15, Pennsylvania..... 1947
TUCK, LESLIE M., Box E5366, St. John's, Newfoundland, Canada..... 1947
L TUCKER, CARLL, Mt. Kisco, New York..... 1929
L TUCKER, MRS. CARLL, 733 Park Ave., New York, New York..... 1924
TUCKER, DONALD [JULIUS], 103 Ballston Ave., Scotia 2, New York..... 1950
TUCKER, ROBERT E[DWARD], 245 N. Auburndale St., Memphis, Tennessee 1944

TUCKER, MRS. ROBERT L., JR. [KATHARINE POISEL], c/o College Apartments, State Teachers College, Oswego, New York..... 1948
TUFTS, DR. HAROLD F[REEMAN], Port Mouton, Queen's County, Nova Scotia..... 1947
TULINOFF, MR. A[NTONINE] V., 1255 Wyoming Ave., Niagara Falls, New York..... 1949
TUNNELL, DR. JOHN W[ESLEY], Taft, Texas..... 1949
TURNER, A[LMON] RICHARD, 637 N. Washington St., Hinsdale, Illinois... 1949
TURNER, ROBERT W[ILLIAM], 10228 Churchill Crescent, Edmonton, Alberta, Canada..... 1949
TUTTRUP, MISS JANE, Bowie Mill Rd., R. R. No. 1, Derwood, Maryland. 1948
M TWOMEY, ARTHUR CORNELIUS, Carnegie Museum, Pittsburgh 13, Pennsylvania .....(1930) 1946
TYLER, BREWSTER P[HILLIPS], 215 W. Unaka Ave., Johnson City, Tennessee..... 1934
TYLER, HORACE, Invermere, British Columbia, Canada..... 1949
TYLER, JOHN G[RIPPER], Box 173, Fresno 7, California..... 1939
TYRRELL, W[ILLIAM] BRYANT, 246 Park Ave., Takoma Park 12, Maryland 1940
LF TYLER, DR. WINSOR MARRETT, 1482 Commonwealth Ave., Brighton, Massachusetts.....(1912) 1950
TYSON, EDWIN L[OUIS], Box 307, Niceville, Florida..... 1950
M UHLER, FRANCIS M[OREY], Fish and Wildlife Service, Patuxent Research Refuge, Laurel, Maryland.....(1924) 1937
ULRICH, MRS. ALICE E., 193 LaSalle Ave., Buffalo, New York..... 1935
ULRICH, EDWARD C., 193 LaSalle Ave., Buffalo, New York..... 1935
L UNDERDOWN, HENRY T[ENER], 8216 Manor Rd., Elkins Park, Pennsylvania..... 1921
UNDERHILL, SLAYTON, Wilmington, New York..... 1950
UNGER, JOSEPH J[OHN], 1457 S. 11th St., Omaha 8, Nebraska..... 1948
UNGLISH, W[ILLIAM] E[LMER], 345 N. Rosanna St., Gilroy, California.... 1924
USSHER, R[ICHARD] D[AVEY], Nancy Lake Farm, R. R. No. 2, King, Ontario, Canada..... 1931
UZZELL, THOMAS M[ARSHALL], JR., 9 Orange St., Charleston, South Carolina..... 1949
VAIDEN, M[EREDITH] GORDON, Box 248, Rosedale, Mississippi..... 1936
VAN ARSDALL, DR. C[HARLES] A[LEXANDER], 1024 Beaumont Ave., Harrodsburg, Kentucky..... 1949
VAN CAMP, LAUREL, Box 11, Genoa, Ohio..... 1942
VAN DEN AKKER, JOHN B., Salt Plains National Wildlife Refuge, Jet, Oklahoma..... 1946
VANDERVORT, CHARLES C[HAMPION], Laceyville, Pennsylvania..... 1937
VAN DEUSEN, HOBART MERRITT, 12 Highland Ave., Montclair, New Jersey..... 1937
VAN DYKE, TERTIUS, Avalon Cottage, Princeton, New Jersey..... 1930
VAN EPPS, CLAUDE A., 780 Utah S. E., Huron, South Dakota..... 1950
VANESELTINE, WILLIAM PARKER, Department of Botany and Bacteriology, Clemson Agricultural College, Clemson, South Carolina..... 1944
L VAN FLEET, CLARK C., Box 696, Lakeport, California..... 1947
VAN HUIZEN, PETER J., White River National Wildlife Refuge, St. Charles, Arkansas..... 1939

VAN IJZENDOORN, A[NTONIUS] L[AMBERTUS] J[OHAN], Koremarkt 1, Hoorn, Holland 1950
VAN MALSSEN, J. F. M., Daal en Bergselaan 68, The Hague, Holland 1946
HL VAN NAME, WILLARD GIBBS, American Museum of Natural History, Central Park West at 79th St., New York 24, New York 1900
VAN TYNE, HELEN BATES [MRS. JOSSELYN], 405 Awixa Rd., Ann Arbor, Michigan 1950
LF VAN TYNE, JOSSELYN, University of Michigan Museum of Zoology, Ann Arbor, Michigan .....(1922) 1936
VAN VORST, NELLE G., 67 Snowden Ave., Schenectady 4, New York 1944
VARNEY, B[ENJAMIN] EARL, 314 Maine St., Brunswick, Maine 1947
VAUGHN, WILLIAM C[OLEMAN], 115 Fairbanks Ave., Kenmore 23, New York 1935
VAUPEL, ROBERT E[RNEST], Struble Rd., Box 218, Cincinnati 31, Ohio ... 1949
M VAURIE, [AUGUSTE JEAN] CHARLES, Bird Department, American Museum of Natural History, Central Park West at 79th St., New York 24, New York .....(1944) 1949
VERGES, EUGENE M[ARCELIN] II, 1126 Beacon St., Brookline, Massachusetts 1931
VERNON, DR. JAMES W[ILLIAM], Broadoaks Sanatorium, Morganton, North Carolina 1937
VINES, ROBERT A., Museum of Natural History, Houston 4, Texas 1950
VOGEL, HOWARD H[OLLISTER], JR., 6054 S. Woodlawn, Chicago, Illinois .. 1941
M VOGT, WILLIAM, 32 Cunningham Ave., Floral Park, New York .... (1928) 1936
VOLLMAR, MRS. R[HEA] LEWIS, 6138 Simpson Ave., St. Louis 10, Missouri 1949
VON BLOEKER, JACK C[HRISTIAN], JR., Allan Hancock Foundation, University of Southern California, Los Angeles 7, California 1941
VORE, MARVIN E[LMER], 1128 N. 8th Ave., West Bend, Wisconsin 1949
VOWELS, MRS. WILLIAM GEORGE, 5046 Greenhurst Ave., Van Nuys, California 1947
WACHENFELD, W[ILLIAM] A[RNOLD], 787 E. Clarke Pl., Orange, New Jersey 1949
WADE, DOUGLAS EDWARD, Constitution Hill, Princeton, New Jersey 1946
WADE, JOSEPH SANFORD, Argonne Apts., 1629 Columbia Rd., N. W., Washington 9, D. C. 1929
WAGNER, MRS. C[ARY] R[ICHARD], South Lane Farm, Utica, Ohio 1950
WAGNER, MISS ESTHER ELIZABETH, 13 Locust Ave., Danbury, Connecticut 1939
WAGNER, MRS. JULIA E[LIZABETH], 818 E. Boulder St., Colorado Springs, Colorado 1949
WAINWRIGHT, C[ARROLL] L[IVINGSTON], JR., Lowell Rd., Concord, Massachusetts 1950
WALCOTT, ROBERT, 912 Barristers Hall, Pemberton Square, Boston, Massachusetts 1924
WALDBAUER, GILBERT PETER, 337 Benham Ave., Bridgeport, Connecticut 1945
M WALKER, CHARLES F[REDERIC], Museum of Zoology, University of Michigan, Ann Arbor, Michigan .....(1927) 1944
WALKER, HARRY BURTON, 635 Landis Ave., Vineland, New Jersey 1947
WALKER, JASON A[LISON], 89 Church St., Box 295, Waterloo, New York . 1948
WALKER, ROLAND, Rensselaer Polytechnic Institute, Biological Laboratory, Troy, New York 1924

WALKER, WINIFRED E[LIZABETH], International People's College, Elsinore, Denmark 1949
LM WALKINSHAW, DR. LAWRENCE H[ARVEY], 1703 Wolverine Tower, Battle Creek, Michigan ..... (1929) 1940
WALL, MRS. MARGARET Y., 6 Springdale Court, Greensboro, North Carolina 1948
WALLACE, FRED B[ROWNE], 3059 Redick Ave., Omaha 11, Nebraska 1949
M WALLACE, GEORGE J[OHN], 517 Ann St., East Lansing, Michigan .. (1935) 1945
WALLACE, ROY FREDERICK, 63 Dupont St., Toronto, Ontario, Canada ... 1947
WALLER, SAM[UEL], Indian School, The Pas, Manitoba, Canada 1949
WALTER, CEDRIC N[ORMAN], 32 Stanley Ave., Beckenham, Kent, England 1948
WALTER, MRS. HERBERT EUGENE [ALICE E.], 67 Oriole Ave., Providence 6, Rhode Island 1938
WALTERS, DON L[UCAS], 1023 S. Woodland St., Independence, Missouri .. 1949
WALTERS, FRANK, Hollis, New Hampshire 1902
WANAMAKER, JOHN, Principia College, Elsah, Illinois 1946
WANLESS, HAROLD R[OLLIN], 127 Natural History Bldg., University of Illinois, Urbana, Illinois 1947
WANZER, JAMES OLIN, 3601—56th St., Sacramento 17, California 1947
WARBURTON, FRED, 982—5th Ave. W., Owen Sound, Ontario, Canada ... 1947
WARBURTON, STANTON, JR., 3516 N. 33rd St., Tacoma, Washington 1938
WARD, ARTHUR, Burnham, Saskatchewan, Canada 1950
WARD, CHARLES L[AKEMAN], JR., 15 Monument St., Concord, Massachusetts 1950
WARFEL, HERBERT E., APO 900, c/o Postmaster, San Francisco, California c/o U. S. Embassy 1949
WARFIELD, BEN[JAMIN] BRECKINRIDGE, 44 E. 67th St., New York 21, New York 1930
WARNER, DWAIN W[ILLARD], Museum of Natural History, University of Minnesota, Minneapolis 14, Minnesota 1942
WARNER, MRS. MIKELL WORMELL, 922 Fiske St., Pacific Palisades, California 1946
WASHINGTON, MRS. WHITING, Trail's End, North Edgecomb, Maine 1947
WATERMAN, AGNESS L[OUISE], Bretton Woods, New Hampshire 1950
WATERMAN, RALPH T[EN EYCK], Meadow Rd., Poughkeepsie, New York. 1947
WATSON, C[HARLES] G[RAY], 201 Ridout St., S., London, Ontario, Canada 1919
WATSON, FRANK G[RAHAM], c/o Shell Chemical Corporation, Box 2633, Houston 1, Texas 1936
WATSON, ROBERT J[AMES], Box 75, Blacksburg, Virginia 1947
WAYRICK, JOHN F[RANCIS], Pines Lake, R. R. No. 1, Paterson, New Jersey 1946
WEART, MISS EDITH L[UCIE], 35-36—76th St., Jackson Heights, New York 1946
WEATHERSBY, MRS. ISABEL M[cCRANEY], 5137 Cantrell Rd., Little Rock, Arkansas 1950
WEAVER, JACK F[REDERICK], Providence Rd., Box 20C, R. R. No. 6, Towson 4, Maryland 1949
WEBER, JAY A[NTHONY], 1400 N. E. 108 St., Miami 38, Florida 1907
WEBSTER, CLARK G[IBBONS], Patuxent Research Refuge, Laurel, Maryland 1948
WEBSTER, HARRY REID, 513 Prince St., Truro, Nova Scotia, Canada 1949
WEBSTER, J[ACKSON] DAN, Hanover College, Hanover, Indiana 1941

WEBSTER, KARL B[LISS], 57 Webster Park Ave., Columbus 2, Ohio..... 1949
WEBSTER, RANDALL, 341 Western Ave., Brookville, Pennsylvania..... 1937
WEEKS, MANGUM, 219 N. Royal St., Alexandria, Virginia..... 1938
WEHMUELLER, JOHN E[DWARD], Box 87, R. R. No. 1, Hollister, California 1949
WEIGEL, EDWIN P[RICE], 2055 W. Touhy Ave., Chicago 45, Illinois..... 1949
WEIGEL, ROBERT DAVID, 492 Massachusetts Ave., Buffalo 13, New York. 1947
WEIRICK, PAUL S[NOWDEN], 806 Hellerman St., Philadelphia 11, Pennsylvania..... 1949
WEISE, CHARLES M[ARTIN], 654 Orchard Ave., Bridgeville, Pennsylvania 1948
WEISER, CHARLES S[PANGLER], Wyndham Hills, York, Pennsylvania .. 1916
WEISER, VIRGIL LEONARD, 507—2nd Ave. E., Dickinson, North Dakota.. 1947
L WELLING, YENS M., 1828 E. 5th St., Anderson, Indiana..... 1924
WELLINGS, S[EFTON] R[OBERT], Box 518, Poulsbo, Washington..... 1949
WELLS, EUGENE L[ANE], Apt. C-53, 779 Riverside Dr., New York 32, New York..... 1949
WELTY, [JOEL] CARL, R. R. No. 1, Beloit, Wisconsin..... 1948
WENDLING, MARIE A., 87 Garrison Rd., Williamsville, New York..... 1949
WENDT, MISS LORINA M., 3701 Jenifer St., N. W., Washington 15, D. C.. 1946
WERNER, RAY C[OWLES], 758 Wildwood Rd., N. E., Atlanta, Georgia.... 1947
WERNICKE, MRS J. F. [MALETA MOORE], Gull Point, Escambia Co., Florida..... 1946
WERNING, JOSEPH R., 224 N. 26th St., Corvallis, Oregon..... 1950
WESSELING, KURT [PAUL], JR., 243 Orrick Lane, Kirkwood 22, Missouri.. 1949
WEST, HENRY C[LOPTON], 5820 Crittenden Ave., Indianapolis 21, Indiana 1950
WEST, JULIUS DAVID, 29 MacLennan Ave., Toronto 5, Ontario, Canada.. 1947
WEST, DR. RALPH E., R. R. No. 1, Sequim, Washington..... 1949
M WESTON, FRANCIS MARION, 2006 E. Jordan St., Pensacola, Florida (1925) 1933
WESTON, HENRY G[RIGGS], JR., Department of Biology, Grinnell College, Grinnell, Iowa..... 1943
WESTON, ROBERT, Old Ferry Rd., North Castine, Maine..... 1946
WETHERBEE, DAVID K[ENNETH], 11 Dallas St., Worcester, Massachusetts 1945
WETHERBEE, MRS. KENNETH B[RACKETT], 11 Dallas St., Worcester, Massachusetts..... 1929
LF WETMORE, ALEXANDER, Smithsonian Institution, Washington 25, D. C. (1908) 1919
WEYDEMEYER, WINTON [WILLIAM], Fortine, Montana..... 1925
WEYL, EDWARD S[TERN], 3827 The Oak Rd., Philadelphia 29, Pennsylvania..... 1921
L WHARTON, WILLIAM PICKMAN, Groton, Massachusetts..... 1907
WHEELER, CHARLES L., 376 Palmer Ave., Falmouth, Massachusetts.... 1940
WHEELER, ROBERT D[ONALD], 210 Pioneer Way, Pullman, Washington.. 1949
WHIGHAM, MRS. ANDREW L[EE], Box 235, Century, Florida..... 1939
WHITAKER, J[AMES] D[AVIS], 411 Linden St., Wellesley Hills, Massachusetts..... 1924
WHITAKER, JAMES LONG, Adams Ave. and Tabor Rd., Philadelphia 20, Pennsylvania..... 1946
WHITCOMB, PEMBERTON, 130 Cedar St., New York 6, New York..... 1948
WHITE, DR. GORDON B[RAINERD], 239 Sugar Loaf St., Port Colbourne, Ontario, Canada..... 1949
WHITE, KEITH LYNDE, Department of Wildlife Management, 424 University Farm Pl., Madison 3, Wisconsin..... 1951

WHITING, ROBERT A[RCHIE], 1228 Chittock Ave., Jackson, Michigan.... 1949
WHITLOW, WAYNE B., 738 S. 4th St., Pocatello, Idaho..... 1949
WHITNEY, DR. NATHANIEL RUGGLES, JR., Salt Lake County General Hospital, Salt Lake City, Utah..... 1947
L WHITTLE, MRS. HELEN GRANGER, Hillsboro, New Hampshire..... 1904
WICKE, A[LFRED] F[REDERICK], JR., 1515 N. "A" St., Pensacola, Florida.. 1949
WICKS, MRS. JUDSON L[ANE], Apt. 407, 2615 Park Ave., Minneapolis 7, Minnesota..... 1922
WIDMANN, BERTHOLD, 4621 Wesley Ave., Los Angeles 37, California.... 1936
WIEDEL, DR. PHILIP D[RESSLER], 1030—5th Ave., New York 28, New York..... 1950
WIGGIN, HENRY T[AYLOR], 151 Tappan St., Brookline, Massachusetts.... 1944
HL WILBUR, ADDISON P[RENTISS], 60 Gibson St., Canandaigua, New York... 1895
WILCOX, HARRY H[AMMOND], JR., 257 S. 38th St., Philadelphia 4, Pennsylvania..... 1938
WILCOX, STEPHEN LEROY, Speonk, Long Island, New York..... 1927
HL WILCOX, THOMAS FERDINAND, Smith Ridge, New Canaan, Connecticut.. 1895
WILDER, THEODORE G[ARFIELD], 125 Oxford Rd., Waukesha, Wisconsin.. 1946
WILES, DR. HAROLD O[LIVER], 623 Campbell Ave., Kalamazoo, Michigan 1939
WILK, ALBERT L[AWRENCE], R. R. No. 2, Camrose, Alberta, Canada..... 1936
M WILLIAMS, ARTHUR BALDWIN, Cleveland Museum of Natural History, 2717 Euclid Ave., Cleveland 18, Ohio.....(1938) 1950
M WILLIAMS, CECIL SLOAN, Fish and Wildlife Service, Department of the Interior, Washington 25, D. C.....(1937) 1950
WILLIAMS, EDWARD A[LEXANDER], 1415 Pullan Ave., Cincinnati 23, Ohio 1950
WILLIAMS, ELLISON A[DGER], 27 Limehouse St., Charleston, South Carolina 1923
WILLIAMS, GEORGE G., The Rice Institute, Houston, Texas..... 1944
WILLIAMS, MISS HELEN J[ACKSON], Apt. 4T, Arlington Towers, 129 N. Arlington Ave., East Orange, New Jersey..... 1950
WILLIAMS, JOHN R[AYNESFORD], The Texas Company, Box 480, Tyler, Texas..... 1936
M WILLIAMS, LAIDLAW [ONDERDONK], Box 152, R. R. No. 1, Carmel, California.....(1919) 1949
WILLIAMS, MISS LOLA E[THEL], 3926 Harney St., Omaha, Nebraska..... 1949
L WILLIAMS, RALPH BEN, Box 2354, Juneau, Alaska..... 1942
WILLIAMS, RAYMOND E[WELL], 330 Burlwood Ave., Oakland 3, California 1950
WILLIAMS, MRS. SYDNEY M., 37 Pond Rd., Wellesley 81, Massachusetts.. 1941
WILLIAMSON, FRANCIS S[IDNEY] L[ANIER], 1A E. Irving St., Chevy Chase 15, Maryland..... 1949
WILLIAMSON, KENNETH, Fair Isle Bird Observatory, 17 India St., Edinburgh, Scotland..... 1950
WILLIS, MISS ANNE EDWARDS, Coalburgh, Virginia..... 1946
WILLIS, CORNELIUS G[RINNELL], 750 Subway Terminal Bldg., 417 S. Hill, Los Angeles 13, California..... 1948
WILLIS, FRANKLIN, Minnesota Museum of Natural History, University of Minnesota, Mineapolis 14, Minnesota..... 1951
WILLIS, FRANKLIN E[LLING], Stewartville, Minnesota..... 1949
WILLIS, MYRA G., 1726—4th Ave., S. E., Cedar Rapids, Iowa..... 1949
WILLOUGHBY, JOHN E[RNEST], 8402 Barron St., Takoma Park 12, Maryland..... 1947
WILMOTH, JAMES H[ERDMAN], Harpur College of State University of New York, Endicott, New York..... 1949

WILSON, ARCHIE F[RANCIS], 1322 Braeburn, Flossmoor, Illinois..... 1937
WILSON, BRUCE VERNON, 815 N. Chipman St., Owosso, Michigan..... 1947
WILSON, HAROLD C[HARLES], Ephraim, Wisconsin..... 1946
WILSON, ROWLAND S[TEELE], 2130 E. Broad St., Columbus 9, Ohio..... 1948
WILSON, VANEZ T[HEURER], Bear River Migratory Bird Refuge, Brigham, Utah..... 1947
WILSON, WINIFRED EDITH, 231 Elm Ave., Westmount, Quebec, Canada.. 1947
WILSON, WYNN A[VIS], 817 Greer St., Fort Worth 3, Texas..... 1950
WINDSOR, ELLEN J[OSEPHINE], 144 Jewett Parkway, Buffalo 14, New York 1948
L WINEMAN, ANDREW, 150 Michigan Ave., Detroit 26, Michigan..... 1932
WING, MRS. ANNE HINSHAW, Box 2406, College Station, Texas..... 1948
WING, HAROLD F[RANCIS], 7165 M-106, Jackson, Michigan..... 1942
M WING, LEONARD W[ILLIAM], Department of Wildlife Management, Texas A. and M. College, College Station, Texas.....(1929) 1945
WINN, H[OWARD] ELLIOTT, Museum of Zoology, University of Michigan, Ann Arbor, Michigan..... 1946
WINN, HUDSON S[UMNER], Department of Zoology, Kansas State College, Manhattan, Kansas..... 1949
WINTERNITZ, R[ICHARD] B[ANCROFT], 2212 W. Colorado Ave., Colorado Springs, Colorado..... 1950
M WITSCHI, EMIL, University of Iowa, Iowa City, Iowa.....(1939) 1946
WOLFARTH, FLOYD P[ARKER], 133 High St., Nutley, New Jersey..... 1937
WOLFE, ETHEL H[YACINTH], 4013 Carson Rd., St. Louis 21, Missouri.... 1949
WOLFE, L[LOYD] R[AYMOND], Apt. 504, 535 Geary St., San Francisco, California..... 1922
WOLFE, W[ILLIAM] F[REDERICK], 13622 Manor Ave., Detroit 4, Michigan 1949
WOLFF, JOHN L[UDWIG], 38 Crane Rd., Scarsdale, New York..... 1948
WOLFLING, CYRIL, Box 87, Westwood Rd., Alden, New York..... 1949
M WOLFSON, ALBERT, Northwestern University, Evanston, Illinois..(1941) 1949
WOOD, CHARLES, 159 Summit St., East Providence 14, Rhode Island.... 1950
WOOD, CHAUNCEY DERBY, 21 Esmond Pl., Tenafly, New Jersey..... 1950
WOOD, DALE T[HACKER], 201 Ocean View Dr., Vista, California..... 1949
WOOD, DR. HAROLD BACON, 3016 N. 2nd St., Harrisburg, Pennsylvania.. 1929
WOOD, JOHN R[IDDELL], c/o Converse Rubber Company, 564 W. Monroe St., Chicago 6, Illinois..... 1949
WOOD, MERRILL, Zoology Department, Pennsylvania State College, State College, Pennsylvania..... 1927
WOOD, RAWSON L[YMAN], 5 Bonnie Heights Rd., Manhasset, New York.. 1942
M WOODBURY, ANGUS MUNN, 248 University St., Salt Lake City 2, Utah (1942) 1950
L WOODS, ROBERT, P. O. Drawer 32, Covina, California..... 1926
WOODWARD, ARTHUR J[ASON], 1166 Millington Rd., Schenectady 9, New York..... 1935
L WOODWARD, MISS BARBARA, 55 Wolcott St., LeRoy, New York..... 1946
WOODWARD, HARRY R[EUBEN], 117 S. Monroe, Pierre, South Dakota.... 1949
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L WOODWARD, MISS SARAH J[ONES], 33 Warren St., Concord, New Hampshire..... 1950
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Woolley, Dorothy F. P., 37 Baby Point, Toronto, Ontario, Canada.... 1947
Woolman, Edward, Haverford, Pennsylvania..... 1925
Work, Telford H., 920 Iliff St., Pacific Palisades, California..... 1944
Workman, William Hughes, Lismore, Windsor Ave., Belfast, Ireland.. 1928
Worth, Dr. C[harles] Brooke, c/o The Rockefeller Foundation, International Health Division, 49 W. 49th St., New York 20, New York 1927
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M Wright, Albert H[azen], 113 E. Upland Rd., Ithaca, New York..(1906) 1919
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LM Wynne-Edwards, Vero Cooper, Natural History Department, Marischal College, University of Aberdeen, Aberdeen, Scotland.....(1930) 1936
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M Yeatter, Ralph Emerson, Illinois State Natural History Survey, Urbana, Illinois.....(1926) 1948
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F Zimmer, John T[odd], American Museum of Natural History, Central Park West at 79th St., New York 24, New York.....(1908) 1933
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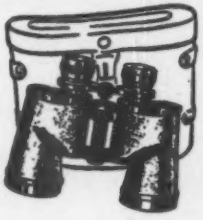

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